Vol. 1146 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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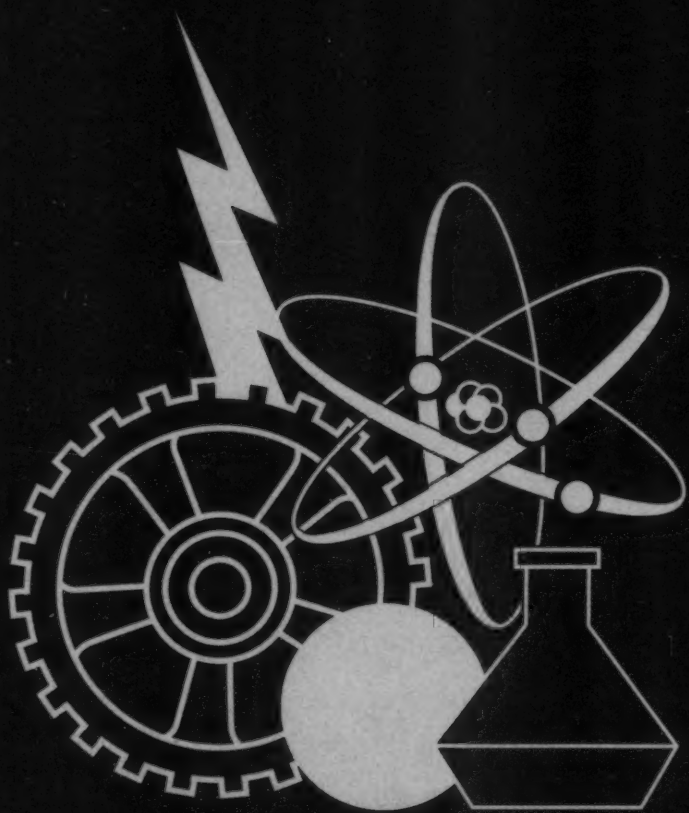
PATENTS

January 26, 1993



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OFFICIAL GAZETTE of the
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January 26, 1993 Volume 1146 Number 4

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1146 OG 726
Notice of Maintenance Fees Payable	1146 OG 726
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees	1146 OG 727
Reissue Applications Filed	1146 OG 731
Requests for Reexaminations Filed	1146 OG 731
Notice of Expiration of Trademark Registrations Due to Failure to Renew	1146 OG 731
Erratum	1146 OG 732
Status of PTO Services	1146 OG 733
Patent and Trademark Office (PTO) Information Contacts	1146 OG 734
Certificates of Correction	1146 OG 743
Special Boxes for Mail	1146 OG 744
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1146 OG 745
Patent Examining Corps	1146 OG 747
Reexaminations	1905
Reissue Patents Granted (34,166)	1911
Plant Patents Granted (8,114)	1913
Patents Granted	
General and Mechanical (5,181,274)	1915
Chemical (5,181,935)	2145
Electrical (5,182,412)	2279
Design Patents Granted (332,686)	2419
Index of Patentees	PI 1
Indices of Reissue, Reexamination, Design and Plant Patents	PI 71
Classification of	
Patents (Including Reissues and Reexaminations)	PI 79
Designs, and Plants Applications	PI 83
Geographical Index of Residence of Inventors	
Patents (Including Reissues and Reexaminations)	PI 85
Designs and Plant Applications	PI 87
Change of Address Form	PI 89
Subscription Order Form	PI 91

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1142 O.G. 66, on Sept. 29, 1992.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1992, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1142 O.G. 20, on Sept. 8, 1992.

International fees, effective on Dec. 1, 1992, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, were announced in the *Official Gazette* at 1143 O.G. 62, on Oct. 27, 1992.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1635.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	450.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	670.00
—Additional examination fee, per additional invention	230.00
International fees	
Basic fee	593.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region for the first 10 national or regional offices	144.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	181.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA	475.00	950.00
Filing with an EPO or JPO search report	415.00	830.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 8, 1992

DOUGLAS B. COMER,
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on January 23, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,894,865 through 4,896,374
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 21, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,564,956 through 4,566,135
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 15, 1992 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,481,680	06/496,610	11/13/84
4,481,682	06/479,819	11/13/84
4,481,684	06/366,843	11/13/84
4,481,689	06/399,298	11/13/84
4,481,691	06/451,483	11/13/84
4,481,702	06/429,893	11/13/84
4,481,711	06/427,403	11/13/84
4,481,712	06/476,920	11/13/84
4,481,716	06/468,293	11/13/84
4,481,717	06/461,646	11/13/84
4,481,724	06/370,124	11/13/84
4,481,725	06/350,749	11/13/84
4,481,730	06/345,218	11/13/84
4,481,736	06/283,441	11/13/84
4,481,739	06/420,629	11/13/84
4,481,741	06/466,688	11/13/84
4,481,751	06/288,140	11/13/84
4,481,755	06/502,643	11/13/84
4,481,756	06/513,822	11/13/84
4,481,757	06/552,535	11/13/84
4,481,759	06/506,129	11/13/84
4,481,760	06/388,622	11/13/84
4,481,763	06/389,144	11/13/84
4,481,765	06/482,055	11/13/84
4,481,772	06/536,372	11/13/84
4,481,787	06/398,955	11/13/84
4,481,797	06/344,988	11/13/84
4,481,798	06/351,352	11/13/84
4,481,805	06/289,241	11/13/84
4,481,807	06/374,633	11/13/84
4,481,808	06/234,069	11/13/84
4,481,810	06/383,894	11/13/84
4,481,813	06/436,944	11/13/84
4,481,818	06/375,126	11/13/84
4,481,825	06/468,063	11/13/84
4,481,827	06/330,901	11/13/84
4,481,828	06/461,315	11/13/84
4,481,832	06/421,938	11/13/84
4,481,840	06/326,466	11/13/84
4,481,841	06/325,865	11/13/84
4,481,842	06/552,863	11/13/84
4,481,843	06/347,463	11/13/84
4,481,855	06/356,392	11/13/84
4,481,859	06/473,419	11/13/84
4,481,860	06/294,996	11/13/84
4,481,861	06/288,207	11/13/84
4,481,866	06/544,256	11/13/84
4,481,867	06/401,979	11/13/84
4,481,868	06/515,793	11/13/84
4,481,873	06/493,432	11/13/84
4,481,876	06/442,821	11/13/84
4,481,882	06/500,314	11/13/84
4,481,896	06/339,216	11/13/84
4,481,898	06/374,242	11/13/84
4,481,913	06/451,006	11/13/84
4,481,918	06/422,681	11/13/84
4,481,928	06/375,219	11/13/84
4,481,932	06/431,618	11/13/84
4,481,933	06/508,850	11/13/84
4,481,934	06/463,148	11/13/84
4,481,948	06/394,409	11/13/84
4,481,970	06/387,154	11/13/84
4,481,973	06/462,666	11/13/84
4,481,981	06/477,339	11/13/84
4,481,987	06/461,849	11/13/84
4,481,991	06/419,797	11/13/84
4,481,998	06/436,138	11/13/84
4,481,999	06/351,378	11/13/84
4,482,003	06/368,446	11/13/84
4,482,013	06/497,302	11/13/84
4,482,015	06/484,759	11/13/84
4,482,017	06/356,526	11/13/84
4,482,018	06/324,698	11/13/84
4,482,019	06/392,876	11/13/84
4,482,020	06/473,646	11/13/84
4,482,021	06/415,377	11/13/84
4,482,023	06/379,430	11/13/84
4,482,024	06/277,223	11/13/84
4,482,028	06/458,808	11/13/84
4,482,029	06/507,097	11/13/84
4,482,030	06/535,046	11/13/84
4,482,038	06/370,768	11/13/84
4,482,039	06/302,879	11/13/84
4,482,040	06/402,832	11/13/84
4,482,041	06/330,130	11/13/84
4,482,042	06/378,865	11/13/84

Patent Number	Serial Number	Issue Date
4,482,043	06/290,102	11/13/84
4,482,048	06/543,301	11/13/84
4,482,056	06/495,599	11/13/84
4,482,062	06/438,032	11/13/84
4,482,065	06/425,554	11/13/84
4,482,068	06/547,107	11/13/84
4,482,069	06/461,974	11/13/84
4,482,074	06/455,656	11/13/84
4,482,081	06/430,536	11/13/84
4,482,084	06/445,352	11/13/84
4,482,085	06/461,603	11/13/84
4,482,091	06/453,200	11/13/84
4,482,093	06/386,377	11/13/84
4,482,097	06/404,023	11/13/84
4,482,099	06/500,873	11/13/84
4,482,106	06/424,869	11/13/84
4,482,108	06/451,654	11/13/84
4,482,118	06/384,389	11/13/84
4,482,129	06/387,114	11/13/84
4,482,135	06/402,765	11/13/84
4,482,137	06/448,617	11/13/84
4,482,144	06/476,699	11/13/84
4,482,162	06/403,474	11/13/84
4,482,164	06/587,847	11/13/84
4,482,176	06/404,563	11/13/84
4,482,177	06/425,045	11/13/84
4,482,179	06/450,051	11/13/84
4,482,188	06/445,910	11/13/84
4,482,189	06/341,985	11/13/84
4,482,196	06/488,202	11/13/84
4,482,207	06/278,672	11/13/84
4,482,209	06/346,099	11/13/84
4,482,214	06/377,635	11/13/84
4,482,220	06/290,934	11/13/84
4,482,222	06/442,363	11/13/84
4,482,223	06/388,687	11/13/84
4,482,225	06/579,817	11/13/84
4,482,231	06/476,936	11/13/84
4,482,233	06/531,593	11/13/84
4,482,245	06/444,606	11/13/84
4,482,252	06/342,084	11/13/84
4,482,257	06/392,636	11/13/84
4,482,260	06/396,753	11/13/84
4,482,262	06/453,495	11/13/84
4,482,267	06/461,152	11/13/84
4,482,269	06/306,512	11/13/84
4,482,270	06/469,603	11/13/84
4,482,274	06/281,372	11/13/84
4,482,277	06/468,368	11/13/84
4,482,283	06/372,557	11/13/84
4,482,290	06/471,567	11/13/84
4,482,291	06/375,634	11/13/84
4,482,294	06/371,344	11/13/84
4,482,299	06/411,248	11/13/84
4,482,300	06/378,676	11/13/84
4,482,301	06/384,816	11/13/84
4,482,302	06/335,570	11/13/84
4,482,303	06/343,206	11/13/84
4,482,315	06/531,446	11/13/84
4,482,316	06/456,490	11/13/84
4,482,319	06/487,666	11/13/84
4,482,320	06/484,149	11/13/84
4,482,323	06/381,551	11/13/84
4,482,325	06/380,277	11/13/84
4,482,328	06/352,917	11/13/84
4,482,329	06/440,826	11/13/84
4,482,337	06/331,792	11/13/84
4,482,338	06/408,488	11/13/84
4,482,341	06/356,916	11/13/84
4,482,343	06/465,612	11/13/84
4,482,344	06/569,014	11/13/84
4,482,346	06/404,345	11/13/84
4,482,349	06/490,591	11/13/84
4,482,351	06/459,691	11/13/84
4,482,358	06/476,099	11/13/84
4,482,375	06/558,204	11/13/84
4,482,376	06/555,434	11/13/84
4,482,397	06/475,425	11/13/84
4,482,398	06/574,433	11/13/84
4,482,401	06/551,515	11/13/84
4,482,418	06/524,167	11/13/84
4,482,421	06/384,221	11/13/84
4,482,425	06/508,525	11/13/84
4,482,430	06/475,174	11/13/84
4,482,433	06/403,436	11/13/84
4,482,442	06/544,993	11/13/84
4,482,443	06/567,050	11/13/84
4,482,445	06/350,425	11/13/84
4,482,455	06/367,122	11/13/84
4,482,456	06/416,953	11/13/84
4,482,462	06/456,909	11/13/84
4,482,466	06/435,584	11/13/84
4,482,468	06/555,776	11/13/84
4,482,474	06/493,672	11/13/84
4,482,478	06/440,152	11/13/84
4,482,481	06/383,880	11/13/84
4,482,484	06/558,230	11/13/84
4,482,486	06/486,863	11/13/84
4,482,488	06/596,953	11/13/84
4,482,489	06/441,690	11/13/84
4,482,504	06/468,223	11/13/84
4,482,506	06/432,472	11/13/84
4,482,508	06/451,782	11/13/84
4,482,509	06/472,001	11/13/84
4,482,520	06/338,090	11/13/84
4,482,522	06/361,951	11/13/84
4,482,523	06/550,858	11/13/84
4,482,528	06/456,923	11/13/84
4,482,530	06/454,377	11/13/84
4,482,531	06/490,082	11/13/84
4,482,532	06/518,718	11/13/84
4,482,537	06/533,714	11/13/84
4,482,541	06/468,911	11/13/84
4,482,542	06/513,136	11/13/84
4,482,544	06/445,117	11/13/84
4,482,548	06/494,645	11/13/84
4,482,549	06/578,014	11/13/84
4,482,550	06/404,921	11/13/84
4,482,551	06/403,951	11/13/84
4,482,552	06/469,233	11/13/84
4,482,554	06/488,922	11/13/84
4,482,557	06/416,130	11/13/84
4,482,567	06/433,283	11/13/84
4,482,572	06/491,619	11/13/84
4,482,573	06/550,583	11/13/84
4,482,574	06/590,543	11/13/84
4,482,577	06/216,889	11/13/84
4,482,578	06/505,509	11/13/84
4,482,590	06/521,597	11/13/84
4,482,591	06/473,280	11/13/84
4,482,593	06/420,427	11/13/84
4,482,594	06/267,618	11/13/84
4,482,596	06/411,346	11/13/84
4,482,599	06/395,103	11/13/84
4,482,602	06/585,268	11/13/84
4,482,607	06/421,887	11/13/84
4,482,608	06/401,842	11/13/84
4,482,609	06/576,353	11/13/84
4,482,613	06/466,817	11/13/84
4,482,616	06/508,524	11/13/84
4,482,620	06/588,605	11/13/84
4,482,634	06/336,136	11/13/84
4,482,653	06/520,660	11/13/84
4,482,654	06/459,569	11/13/84
4,482,656	06/537,215	11/13/84
4,482,663	06/397,399	11/13/84
4,482,665	06/417,949	11/13/84
4,482,667	06/586,374	11/13/84
4,482,676	06/473,697	11/13/84
4,482,679	06/530,803	11/13/84
4,482,683	06/556,984	11/13/84
4,482,684	06/426,048	11/13/84
4,482,691	06/535,006	11/13/84
4,482,693	06/528,156	11/13/84
4,482,698	06/521,098	11/13/84
4,482,702	06/563,435	11/13/84

Patent Number	Serial Number	Issue Date
4,482,718	06/393,387	11/13/84
4,482,722	06/502,210	11/13/84
4,482,728	06/370,020	11/13/84
4,482,730	06/475,986	11/13/84
4,482,737	06/439,101	11/13/84
4,482,739	06/493,855	11/13/84
4,482,740	06/453,499	11/13/84
4,482,741	06/569,367	11/13/84
4,482,747	06/551,487	11/13/84
4,482,750	06/452,178	11/13/84
4,482,751	06/465,943	11/13/84
4,482,752	06/454,301	11/13/84
4,482,753	06/479,299	11/13/84
4,482,755	06/514,253	11/13/84
4,482,757	06/507,399	11/13/84
4,482,758	06/449,294	11/13/84
4,482,759	06/468,593	11/13/84
4,482,760	06/552,106	11/13/84
4,482,765	06/507,475	11/13/84
4,482,770	06/241,281	11/13/84
4,482,776	06/507,761	11/13/84
4,482,778	06/486,470	11/13/84
4,482,779	06/486,471	11/13/84
4,482,780	06/445,772	11/13/84
4,482,782	06/417,240	11/13/84
4,482,784	06/344,874	11/13/84
4,482,789	06/423,866	11/13/84
4,482,791	06/429,155	11/13/84
4,482,798	06/441,971	11/13/84
4,482,806	06/315,087	11/13/84
4,482,812	06/398,879	11/13/84
4,482,816	06/402,343	11/13/84
4,482,833	06/568,309	11/13/84
4,482,845	06/429,067	11/13/84
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4,482,875	06/388,742	11/13/84
4,482,877	06/479,617	11/13/84
4,482,883	06/538,358	11/13/84
4,482,884	06/287,330	11/13/84
4,482,900	06/417,726	11/13/84
4,482,902	06/413,148	11/13/84
4,482,909	06/404,179	11/13/84
4,482,912	06/344,976	11/13/84
4,482,919	06/378,089	11/13/84
4,482,929	06/391,060	11/13/84
4,482,935	06/600,601	11/13/84
4,482,940	06/553,419	11/13/84
4,482,946	06/424,759	11/13/84
4,482,950	06/307,942	11/13/84
4,482,968	06/334,928	11/13/84
4,482,969	06/356,594	11/13/84
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4,483,005	06/305,274	11/13/84
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4,483,015	06/428,089	11/13/84
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4,783,869	07/029,712	11/15/88
4,783,874	07/034,058	11/15/88
4,783,876	06/903,323	11/15/88
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4,783,882	06/818,155	11/15/88
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4,783,893	07/093,569	11/15/88
4,783,897	07/121,051	11/15/88
4,783,905	07/107,706	11/15/88
4,783,908	07/048,440	11/15/88
4,783,914	06/927,274	11/15/88
4,783,918	06/893,308	11/15/88
4,783,920	06/843,121	11/15/88
4,783,924	07/014,369	11/15/88
4,783,927	07/022,946	11/15/88
4,783,931	07/035,601	11/15/88
4,783,934	06/934,234	11/15/88
4,783,950	07/035,582	11/15/88
4,783,951	07/143,217	11/15/88
4,783,952	07/131,195	11/15/88
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4,783,962	06/878,349	11/15/88
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4,783,974	07/069,507	11/15/88
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4,784,021	06/847,378	11/15/88
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4,784,066	06/883,569	11/15/88
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4,784,077	07/016,558	11/15/88
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4,784,089	07/128,042	11/15/88
4,784,092	07/104,267	11/15/88
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4,784,124	06/883,413	11/15/88
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4,784,142	06/926,971	11/15/88
4,784,146	06/896,237	11/15/88
4,784,157	07/007,678	11/15/88
4,784,163	07/023,987	11/15/88
4,784,168	07/029,818	11/15/88
4,784,169	07/023,981	11/15/88
4,784,171	07/109,484	11/15/88
4,784,172	07/066,326	11/15/88
4,784,175	07/030,267	11/15/88
4,784,180	07/099,305	11/15/88
4,784,186	07/096,491	11/15/88
4,784,187	07/038,825	11/15/88
4,784,188	06/939,134	11/15/88
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4,784,202	07/069,830	11/15/88
4,784,203	06/902,207	11/15/88
4,784,206	07/128,063	11/15/88
4,784,216	06/905,367	11/15/88
4,784,218	06/899,454	11/15/88
4,784,232	06/933,198	11/15/88
4,784,233	07/078,169	11/15/88
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4,784,241	07/073,923	11/15/88
4,784,249	06/783,003	11/15/88
4,784,252	07/020,351	11/15/88
4,784,257	07/125,847	11/15/88
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4,784,263	07/071,632	11/15/88
4,784,268	07/075,569	11/15/88
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4,784,277	07/042,311	11/15/88
4,784,281	06/923,011	11/15/88
4,784,291	07/067,139	11/15/88
4,784,299	07/034,274	11/15/88

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4,784,300	07/109,177	11/15/88
4,784,301	07/011,436	11/15/88
4,784,303	06/929,749	11/15/88
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4,784,390	07/038,774	11/15/88
4,784,391	06/927,819	11/15/88
4,784,393	07/054,222	11/15/88
4,784,394	07/034,542	11/15/88
4,784,396	07/056,071	11/15/88
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4,784,409	06/688,358	11/15/88
4,784,414	07/090,596	11/15/88
4,784,419	07/163,447	11/15/88
4,784,422	06/943,269	11/15/88
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4,784,440	07/179,668	11/15/88
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4,784,702	07/039,538	11/15/88
4,784,704	07/002,270	11/15/88
4,784,709	06/776,081	11/15/88
4,784,710	07/102,165	11/15/88
4,784,712	06/727,973	11/15/88
4,784,716	06/795,572	11/15/88
4,784,724	06/852,363	11/15/88
4,784,726	06/942,304	11/15/88
4,784,727	06/459,314	11/15/88
4,784,733	07/124,221	11/15/88
4,784,741	07/095,920	11/15/88
4,784,751	06/911,159	11/15/88
4,784,756	07/019,793	11/15/88
4,784,758	06/900,666	11/15/88
4,784,760	07/045,177	11/15/88
4,784,765	06/860,321	11/15/88
4,784,768	07/169,815	11/15/88
4,784,770	06/864,082	11/15/88
4,784,774	07/105,933	11/15/88
4,784,777	07/021,615	11/15/88
4,784,783	07/132,938	11/15/88
4,784,795	06/814,142	11/15/88
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4,784,805	07/046,500	11/15/88
4,784,813	07/053,378	11/15/88
4,784,820	06/895,396	11/15/88
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4,784,823	06/344,966	11/15/88
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4,784,835	06/873,966	11/15/88
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4,784,842	07/100,837	11/15/88
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4,784,849	07/010,388	11/15/88
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4,784,947	06/611,913	11/15/88
4,784,958	06/672,681	11/15/88
4,784,960	06/582,038	11/15/88
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4,784,995	07/059,584	11/15/88
4,784,997	06/942,468	11/15/88
4,785,002	06/914,090	11/15/88
4,785,005	06/878,123	11/15/88
4,785,006	06/872,686	11/15/88
4,785,007	06/847,255	11/15/88
4,785,012	07/036,267	11/15/88
4,785,014	06/927,900	11/15/88
4,785,019	06/833,948	11/15/88
4,785,029	07/034,416	11/15/88
4,785,039	07/079,071	11/15/88
4,785,041	07/140,265	11/15/88
4,785,044	07/084,684	11/15/88
4,785,049	07/078,457	11/15/88
4,785,057	06/858,851	11/15/88
4,785,062	06/636,419	11/15/88
4,785,064	06/926,645	11/15/88
4,785,066	07/144,209	11/15/88
4,785,073	06/723,957	11/15/88
4,785,082	06/795,093	11/15/88
4,785,093	07/048,172	11/15/88
4,785,097	06/912,717	11/15/88

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4,785,100	07/103,329	11/15/88
4,785,104	07/051,767	11/15/88
4,785,107	06/873,706	11/15/88
4,785,109	07/008,882	11/15/88
4,785,114	06/907,221	11/15/88
4,785,115	07/084,784	11/15/88
4,785,117	07/104,701	11/15/88
4,785,121	06/947,798	11/15/88
4,785,140	07/093,598	11/15/88
4,785,148	06/945,974	11/15/88
4,785,155	06/871,438	11/15/88
4,785,160	07/081,706	11/15/88
4,785,162	06/925,612	11/15/88
4,785,178	06/866,701	11/15/88
4,785,179	07/057,665	11/15/88
4,785,195	07/056,869	11/15/88
4,785,211	07/018,353	11/15/88
4,785,222	07/072,134	11/15/88
4,785,223	06/816,045	11/15/88
4,785,225	07/105,234	11/15/88
4,785,233	07/089,076	11/15/88
4,785,236	06/931,820	11/15/88
4,785,242	06/941,850	11/15/88
4,785,245	06/906,749	11/15/88
4,785,261	07/051,562	11/15/88
4,785,286	06/824,483	11/15/88
4,785,289	07/037,781	11/15/88
4,785,291	07/022,994	11/15/88
4,785,301	06/943,721	11/15/88
4,785,305	07/040,038	11/15/88
4,785,317	07/098,845	11/15/88
4,785,320	07/091,386	11/15/88
4,785,336	06/937,741	11/15/88
4,785,347	06/802,343	11/15/88
4,785,375	07/061,181	11/15/88
4,785,376	07/038,297	11/15/88
4,785,404	06/733,658	11/15/88
4,785,415	06/901,866	11/15/88
4,785,419	07/121,187	11/15/88
4,785,425	07/020,057	11/15/88
4,785,429	07/021,780	11/15/88
4,785,437	06/806,246	11/15/88
4,785,438	06/814,438	11/15/88
4,785,457	07/048,359	11/15/88
4,785,461	07/011,084	11/15/88
4,785,462	06/898,145	11/15/88
4,785,467	07/039,219	11/15/88
4,785,473	06/675,419	11/15/88

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,976,251, Re. S.N. 07/987,696, Filed Dec. 9, 1992, Cl. 125/13.00R, TILE SAW APPARATUS AND METHOD, Allen L. Smith, Owner of Record: *Inventor,* Attorney or Agent: Terry M. Crellin, Ex. Gp.: 3203

4,985,093, Re. S.N. 07/983,994, Filed Dec. 1, 1992, Cl. 149, MELT CAST EXPLOSIVES, Charles R. McCulloch, Owner of Record: *Explosive Research and Development Corp.,* Attorney or Agent: Donald C. Casey, Ex. Gp.: 2204

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

D. 250,480, Reexam. No. 90/002,904, Requested Dec. 11, 1992, Cl. D24/170, BIPOLAR ELECTRICAL SURGICAL GENERATOR, Ludwig A. Wettermann, et. al., Owner of Record: *Richard Wolf Medical Instruments Corp., Vernon Hills, Ill.,* Attorney or Agent: Nate F. Scarpelli, Ex. Gp.: 290, Requester: Owner

5,143,325, Reexam. No. 90/002,901, Requested Dec. 7, 1992, Cl. 244/134, ELECTROMAGNETIC REPULSION SYSTEM FOR REMOVING CONTAMINANTS SUCH AS ICE FROM THE SURFACES OF AIRCRAFT AND OTHER OBJECTS, Peter B. Zieve, et. al., Owner of Record: *Electroimpact Inc., Seattle, Wash.,* Attorney or Agent: Graybeal, Jensen & Puntigam, Ex. Gp.: 310, Requester: The B. F. Goodrich Co., Brecksville, Ohio

Notice of Expiration of Trademark Registrations Due to Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED DECEMBER 28, 1992 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
37,976	70/037,976	3/25/1902
85,922	71/059,532	3/26/1912
292,617	71/320,873	3/22/1932
292,625	71/317,307	3/22/1932
292,631	71/320,383	3/22/1932
292,637	71/319,785	3/22/1932
292,638	71/319,694	3/22/1932
292,641	71/318,926	3/22/1932
292,646	71/320,403	3/22/1932
292,655	71/320,246	3/22/1932
292,669	71/319,697	3/22/1932
292,677	71/321,541	3/22/1932
292,691	71/316,632	3/22/1932
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556,481	71/523,337	3/25/1952
556,484	71/533,400	3/25/1952
556,488	71/539,038	3/25/1952
556,494	71/547,581	3/25/1952
556,502	71/555,591	3/25/1952
556,504	71/557,509	3/25/1952
556,505	71/558,024	3/25/1952
556,512	71/564,221	3/25/1952
556,520	71/566,765	3/25/1952
556,521	71/566,842	3/25/1952
556,524	71/569,627	3/25/1952
556,540	71/579,214	3/25/1952
556,542	71/580,385	3/25/1952
556,546	71/582,054	3/25/1952
556,547	71/582,195	3/25/1952
556,550	71/583,058	3/25/1952
556,551	71/583,885	3/25/1952
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556,588	71/593,936	3/25/1952
556,593	71/594,490	3/25/1952

Reg. Number	Serial Number	Reg. Date
556,603	71/596,667	3/25/1952
556,617	71/599,557	3/25/1952
556,624	71/600,797	3/25/1952
556,637	71/602,015	3/25/1952
556,639	71/602,376	3/25/1952
556,640	71/602,492	3/25/1952
556,642	71/602,590	3/25/1952
556,648	71/603,189	3/25/1952
556,652	71/603,672	3/25/1952
556,653	71/603,673	3/25/1952
556,666	71/604,866	3/25/1952
556,671	71/605,981	3/25/1952
556,676	71/606,771	3/25/1952
556,687	71/608,411	3/25/1952
556,697	71/609,411	3/25/1952
556,700	71/609,688	3/25/1952
556,701	71/609,754	3/25/1952
556,722	71/611,671	3/25/1952
556,723	71/611,770	3/25/1952
556,730	71/612,630	3/25/1952
556,737	71/613,165	3/25/1952
556,739	71/613,401	3/25/1952
556,742	71/613,617	3/25/1952
556,754	71/614,128	3/25/1952
556,769	71/615,726	3/25/1952
556,771	71/617,173	3/25/1952
556,774	71/618,364	3/25/1952
556,775	71/618,896	3/25/1952
556,778	71/594,708	3/25/1952
556,787	71/575,103	3/25/1952
556,788	71/579,054	3/25/1952
556,795	71/590,142	3/25/1952
556,799	71/594,603	3/25/1952
556,804	71/607,273	3/25/1952
556,808	71/608,683	3/25/1952
556,813	71/617,965	3/25/1952
556,814	71/617,966	3/25/1952
928,378	72/393,061	2/01/1972
931,045	72/296,271	3/21/1972
931,046	72/343,364	3/21/1972
931,049	72/355,939	3/21/1972
931,055	72/379,191	3/21/1972
931,056	72/381,574	3/21/1972
931,060	72/386,948	3/21/1972
931,064	72/366,176	3/21/1972
931,065	72/366,177	3/21/1972
931,067	72/380,470	3/21/1972
931,075	72/300,739	3/21/1972
931,079	72/355,814	3/21/1972
931,080	72/373,811	3/21/1972
931,081	72/381,304	3/21/1972
931,082	72/381,948	3/21/1972
931,086	72/397,514	3/21/1972
931,088	72/379,170	3/21/1972
931,089	72/353,667	3/21/1972
931,098	72/370,370	3/21/1972
931,099	72/376,954	3/21/1972
931,100	72/323,315	3/21/1972
931,104	72/363,030	3/21/1972
931,105	72/364,477	3/21/1972
931,108	72/375,509	3/21/1972
931,109	72/375,636	3/21/1972
931,113	72/380,486	3/21/1972
931,115	72/384,010	3/21/1972
931,117	72/326,930	3/21/1972
931,121	72/371,442	3/21/1972
931,126	72/370,839	3/21/1972
931,134	72/340,844	3/21/1972
931,135	72/340,845	3/21/1972
931,136	72/367,686	3/21/1972
931,149	72/374,983	3/21/1972
931,153	72/379,091	3/21/1972
931,156	72/379,932	3/21/1972
931,160	72/391,492	3/21/1972
931,161	72/394,443	3/21/1972
931,162	72/365,689	3/21/1972
931,164	72/359,195	3/21/1972
931,165	72/371,461	3/21/1972
931,167	72/385,563	3/21/1972
931,168	72/352,863	3/21/1972
931,172	72/364,507	3/21/1972
931,174	72/381,302	3/21/1972
931,175	72/332,781	3/21/1972
931,179	72/349,142	3/21/1972
931,180	72/369,852	3/21/1972
931,183	72/368,530	3/21/1972
931,184	72/281,151	3/21/1972
931,186	72/317,880	3/21/1972
931,187	72/317,881	3/21/1972
931,188	72/348,108	3/21/1972
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Errata

"All reference to D 331,845 to Larry R. Mackler of San Diego, Calif., for 'ROTATABLE PRODUCT ORGANIZER' appearing in the *Official Gazette* of Dec. 22, 1992 should be deleted since no patent was granted."

"All reference to Patent No. 5,175,572 to Terry D. Beard of Calif., for 'DIGITAL SYSTEM AND METHOD FOR MOTION PICTURE FILMS' appearing in the *Official Gazette* of Dec. 29, 1992 should be deleted since no patent was granted."

"All reference to Patent No. 5,175,574 to Terry D. Beard of Calif., for MOTION PICTURE DIGITAL SOUND SYSTEM AND METHOD' appearing in the *Official Gazette* of Dec. 29, 1992 should be deleted since no patent was granted."

Status of PTO Services

The following is an update of the status of PTO services for Dec. 1992:

Service Item	FY 1993 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:		
Patents	22	38
Trademarks	30	49
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	6 Hours
Window Coupons	5	1
Mail Coupons	12	3
Letter Orders	16	15
Electronic Ordering Service (EOS)	11	2
Certified Copies:		
Trademark Registrations	21	16
Patent Applications-As-Filed	17	14
Patent Applications Expedited	7	5
Patent File-Wrapper/Contents	N/A	18
TM Applications-As-Filed	17	11
TM Applications Expedited	7	3
Patent Copies	17	8
Trademark Search Library:		
Filing Pending Marks	23	50
Filing Reg. Certificates	Issue Date + 2 days	Issue + 2
Filing Temp. Drawings	8	21
Assignments:		
Recording Patents-New Applications	20	25
Recording Patents-Mail Room Recpts.	20	30
Return Patents-New Applications	34	38
Return Patents-Mail Room Recpts.	34	41
Recording Trademarks	20	31
Returning Trademark Documents	34	41
Avg. Days from Issue Fee Payment to Issue Date	90-100	114
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On Time
Patent Copies Available	95% on Issue Date	90% on Issue Date
Trademark Copies Available	95% on Issue Date	99% on Issue Date

*Unless otherwise noted.

Jan. 4, 1993

THERESA A. BRELSFORD
Assistant Commissioner for Public Services and Administration

PATENT AND TRADEMARK OFFICE (PTO) INFORMATION CONTACTS

TABLE OF CONTENTS

General
Patents
Trademarks

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For information and assistance, you may call the following telephone numbers, Monday through Friday, 8:30 a.m. to 5:00 p.m. (EST/EDT)

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Personal Help with Service Problems (Unsuccessfully Resolved through Normal Channels)

PTO's HELP Lines 308-HELP/4357
Public Service Branch
Public Information Services Division
Center for Patent and Trademark Information Services

PTO Employee Telephone Numbers

Employee Locator 308-4455

Special Assistance to Hearing-Impaired Persons

Telecommunication Device for the Deaf (TDD) 305-7785

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Washington, D.C. 20231

Box No./Name	*Specified Purpose*
Box Patent Application	New patent applications and associated papers and fees.
Box Trademark Application	New trademark applications and associated papers and fees.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislation and International Affairs.
Box 5	"No fee" mail related to trademarks.
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 8	All mail for the Office of the Solicitor, *except* communications relating to *pending litigation*. Mail relating to pending litigation must be addressed to Office of the Solicitor, P.O. Box 15667, Arlington, Va. 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents except trademark registrations.
Box 11	Electronic Ordering Service (EOS).
Box 12	Contributions to the Examiner Education Program.
Box 15	Mail for the Advisory Commission on Patent Law Reform.
Box 16	Mail for the Office of Finance from deposit account holders who wish to deposit replenishment checks to their PTO accounts.
Box 17	Mail for the Office of Finance from vendors for payment of invoices.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Assignment	All assignment documents *except* those filed with new applications.
Box DAC	Petitions to revive, petitions to accept late payment of fees, petitions to defer issue, and petitions to withdraw an application from issue.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Rule 312 amendments should be mailed to Box Issue Fee also. Assignments must be submitted in a separate envelope and *not sent to Box Issue Fee.*
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Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection.)
Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty (PCT).
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical applications.
Box SN	For fees and petitions under 37 CFR 1.182 to obtain dates received and/or serial numbers for patent applications *prior* to PTO's standard notifications (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or " Notice of Incomplete Application").

Assignment Search Information

Patent 308-2768
Trademark 308-9855

Attorney's Roster 308-9617

Automated Search Systems Training for Public

Public User Training Branch 308-3924
Patent Search Room 308-0595
Trademark Search Library 308-9800

Cashier's Windows (Office of Finance)

Patent Search Room 308-0649
Trademark Search Library 308-9810

Civil Rights, Office of 305-8292

Telecommunications Device for the Deaf (TDD) 305-8059

Congressional Liaison 305-9310

Copier Machine Access System Cards

Cashier's Office (Patent Search Room) 308-0649
Encoder's Office (Patent Search Room) 308-0077
Cashier's Office (Trademark Search Library) 308-9810
Encoder's Office (Trademark Search Library) 308-9809

Coupon Orders (Patent and Trademark Copy Sales) 308-0904

Deposit Accounts

Balance Inquiry (Requires Touch-Tone Telephone) 305-8735/8746
General Information 308-0902
Remittances 308-0902

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Patent and Trademark Office
P.O. Box 70541
Chicago, Ill. 60673

OR

Commissioner of Patents and Trademarks
Box 16
Washington, D.C. 20231

Disabled, Requests for Reasonable Accommodation for 305-8292

Employee Locator 308-4455

Employment (General Information) 305-8231

Telecommunications Device for the Deaf (TDD) 305-8586

Fees

Fee Rates 308-HELP/4357
Fee Receipts 308-0904
General Information 308-HELP/4357
Refunds 305-4229

File Information Unit 308-2733

Forms, Patent and Trademark 308-HELP/4357

Help with Service Problems (Unsuccessfully resolved through normal channels) 308-HELP/4357

Information, General

PTO's Automated INFOrmation Lines 557-INFO/4636
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Journal of the Patent and Trademark Office Society (JPTOS)

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JPTOS
Box 2600
Arlington, Va. 22202

Library, PTO
(See Scientific and Technical Information Center)

Official Gazette (Government Printing Office)

Distribution and/or Subscription Problems ..... (202) 512-2303

Official Gazette, Notices 305-8594

Patents Available for Licensing or Sale 308-0402

Patent and Trademark Depository Library Program (PTDLP) 308-3924

For a list of PTDLs and contact information, see *Official Gazette* issues (Notices section).

Procurement 305-8014

Telecommunications Device for the Deaf (TDD) 305-8018

Project XL 305-8292

Telecommunications Device for the Deaf (TDD) 305-8059

Public Affairs 305-8341

Address mail to:

Commissioner of Patents and Trademarks
Box 4
Washington, D.C. 20231

Public Search Facilities

Patents 308-0595
(Hours: Weekdays, 8:00 a.m. to 8:00 p.m., EST/EDT)
Patent Assignments 308-2768
(Hours: Weekdays, 8:30 a.m. to 5:00 p.m., EST/EDT)
Trademarks 308-9800
(Hours: Weekdays, 8:00 a.m. to 5:30 p.m., EST/EDT)
Trademark Assignments 308-9855
(Hours: Weekdays, 8:00 a.m. to 5:30 p.m., EST/EDT)

Public Service Branch, Public Information Services Division

For help with service problems unsuccessfully resolved through normal channels 308-HELP/4357

For general information on how to file for a patent or trademark:

PTO's Automated Information Lines 557-INFO/4636
(Requires Touch-Tone Telephone)
Patents (Message 11)
Trademarks (Message 38)

Telecommunications Device for the Deaf (TDD) 305-7785

Public Service Windows

Patent Search Room 308-1057
Trademark Search Library 308-9811

Publications, General Information 557-INFO/4636

Reasonable Accommodation for the Disabled, Requests for 305-8292

Scientific and Technical Information Center 308-0810

Solicitor 305-9035

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Washington, D.C. 20231

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Office of the Solicitor
P.O. Box 15667
Arlington, Va. 22215

Status, Patent and Trademark

Patent Applications ..... Appropriate Examining Group or 308-7004
Patents 308-7004
Trademark Applications 305-8748
Trademark Registered Files 305-8748

Telecommunications Devices for the Deaf (TDD)

Civil Rights 305-8059
Employment 305-8586
Procurement 305-8018
Project XL 305-8059
Public Service 305-7785

Workforce Effectiveness Division (Employee Training and Career Development) 305-8431

Patents

Advance Orders of Patent Soft Copies, Non-Receipt 305-8237

Amendments

General Information 308-HELP/4357
Specific Pending Applications ..... Appropriate Examining Group

Address Amendments after Final Rejection to:

Commissioner of Patents and Trademarks
Box AF
Washington, D.C. 20231

Address Rule 312 Amendments to:

Commissioner of Patents and Trademarks
Box Issue Fee
Washington, D.C. 20231

Address Non-Fee Amendments (except after final rejection) to:

Commissioner of Patents and Trademarks
Box Non-Fee Amendment
Washington, D.C. 20231

Applications

Address new patent applications to:

Commissioner of Patents and Trademarks
Box Patent Application
Washington, D.C. 20231

Examination ..... Appropriate Examining Group
General Information 308-HELP/4357
Patent Cooperation Treaty (PCT) - General Information 305-3257
Post-Examination 305-8283
Pre-Examination 308-HELP/4357
Re-Examination - General Information 308-HELP/4357
Status Inquiry of Pending Applications ..... Appropriate Examining Group or 308-7004
Statutory Invention Registration (SIRS) Group 220 308-0766

Assignments

Changes Affecting Title of Pending Applications and Patented Files 308-9723
Information Concerning Pending Patent Assignments 308-9723
Recording Assignments 308-9723
Search Information 308-2768

Attorneys, Conduct of 308-9618

Attorneys/Agents Registered to Practice Before PTO 308-9617

Attorney's Window
(See Public Service Window)

Cashier's Window, Office of Finance 308-0649
(Patent Search Room)

CASSIS/CD-ROM (Classification and Search Support Information System/Compact Disc - Read Only Memory)

General Information 308-0322
Problem Resolution for Commercial Subscribers 308-0322
Subscription 308-0322

CD-ROM Products 308-0322
(Also see CASSIS/CD-ROM)

Certificates of Correction 305-8408

Change of Address

Pending Patent Applications ..... Appropriate Examining Group
Issued Patents for Maintenance Fee Notification 308-9752

Classification Definitions, Changes and Reclassification Orders (Sale of) 305-6101

Classification of Published Patents 305-5951

Complaints (Services) 308-HELP/4357

Copies

Abandoned File Histories (Local Access for Public Copying) 308-2733
Abstracts of Title* 308-1200
Advance Orders, Non-Receipt 305-8237
Applications As Filed* 308-9726
File Wrapper and Contents* 308-9726
Certified Copies of Patent Documents Except Assignments* 308-9726
Certified Copies of Patent Assignment Documents* 308-1200

Electronic Ordering Service (EOS) 305-4350
Foreign Patents 308-1076
Patented File Histories
(Local Access for Public Copying) 308-2733
U.S. Patents 305-4350

Address orders for certified copies of these products to:

Commissioner of Patents and Trademarks
Box 10
Washington, D.C. 20231

Depository Libraries, Patent and Trademark (PTDLs) 308-3924

Disclaimers 305-8408

Disclosure Document Program 308-0995

Drawing Corrections 305-8404

Duty of Disclosure Matters 305-9384

Electronic Information Products and Services, Office of 308-0322

Enrollment and Discipline 308-9618
(Requests for Applications)

Address mail to:

Commissioner of Patents and Trademarks
Box OED
Washington, D.C. 20231

Examining Groups

Chemical Examining Groups

Group 1100 308-0661
Group 1200 308-1235
Group 1300 308-0651
Group 1500 308-2351
Group 1800 308-0196

Electrical Examining Groups

Group 2100 308-1782
Group 2200 308-0766
Group 2300 308-0754
Group 2400 308-0771
Group 2500 308-0956
Group 2600 305-4700
Group 2900 305-3291

Mechanical Examining Groups

Group 3100 308-1113
Group 3200 308-1148
Group 3300 308-0858
Group 3400 308-0861
Group 3500 308-2168

Fees

Fee Rates 308-HELP/4357
Fee Receipts 308-0904
General Information 308-HELP/4357
Refunds 305-4229

File Wrapper Continuation Applications 308-1202

Address mail to:

Commissioner of Patents and Trademarks
Box FWC
Washington, D.C. 20231

Files (File Information Unit)

Abandoned File Histories 308-2733
Patented File Histories 308-2733
Pending Patent Applications 308-2733

Filing Receipt Corrections 308-3610

Foreign Patents

Copies 308-1076
Reference Assistance
(Hours: Weekdays, 8:30 a.m. to 5:00 p.m., EST/EDT) 308-1076

Forms

Patents 308-HELP/4357
PCT 308-4129

Inspection of Patent Files 308-2733

Interferences 557-4101

Address mail to:

Commissioner of Patents and Trademarks
Box Interference
Washington, D.C. 20231

Inventors

Correction of Error in Joining Inventors
Applications ..... Appropriate Examiner or 305-9384
Patents ..... Appropriate Group Art Unit Supervisor
Deceased, Filing Applications for 305-9384

Issue Fee

Address mail to:

Commissioner of Patents and Trademarks
Box Issue Fee
Washington, D.C. 20231

Balance of Issue Fee Transmittals 305-8283
Issue Fee Receipt, Incorrect 305-8283
Issue Fee Receipt, Non-Receipt 305-8283
Lapse Notices 305-8283

License (Request to file patent application abroad) 308-1722

Maintenance Fees 308-9752

Address mail to:

Commissioner of Patents and Trademarks
Box M Fee
Washington, D.C. 20231

OR

Fax to:

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Manual of Classification

General Information 305-6101
Index to 305-6101

Manual, Sale of

Address inquiries to:

Superintendent of Documents
Government Printing Office
Washington, D.C. 20402
(202) 783-3238

Subclass Listing, Sale of 308-0322

Manual of Patent Examining Procedure (MPEP) 305-9384

Manual, Sale of or Subscription to

Address inquiries for printed manual to:

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Government Printing Office
Washington, D.C. 20402
(202) 783-3238

Sale of or Subscription to MPEP on disc or CD-ROM 308-0322

Notice of Allowance ..... Appropriate Examining Group

Notice of Appeal

Board of Patent Appeals and Interferences 557-4101
Court of Appeals for the Federal Circuit (CAFC) 305-9035

Official Searches 308-7004

Patent and Trademark Depository Library Program (PTDLP) 308-3924

Patent Cooperation Treaty (PCT) 305-3257

Address mail to:

Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Patent Documentation Society (PDS) 305-7439

Patent Grant, Non-Receipt 305-8203

Patent Index

Index Support 305-5951
Use of Index 305-5951

Patent Term Extension 305-9384

Patented Files 308-2733

Petitions

Abandonment, Withdrawal of Examiner's Holding of ..... Appropriate Examining Group Director

Access to Application Files ..... Office of Special Program Examination 305-9384

Amendment
After Payment of Issue Fee ..... Appropriate Examining Group Director

Refusal to Enter an Amendment ..... Appropriate Examining Group Director

Appeals
Reinstate, Appeal Dismissed by Group ..... Appropriate Examining Group Director

Application
Acceptance of When Filed by Other Than Inventor ..... Office of Special Program Examination 305-9384

Assignments and Issuance of Patents to Assignees ..... Office of Petitions 305-9282

Attorney, Withdrawal of ..... Appropriate Examining Group Director

Certificates of Correction, Refusal to Issue ..... Office of Petitions 305-9282

Concurrent Ex Parte and/or Inter Partes Proceedings ..... Appropriate Examining Group Director

Disclaimers ..... Office of Petitions 305-9282

Divisional Reissue ..... Office of Special Program Examination 305-9384

Examiner's Requirements or Holdings, Review of ..... Appropriate Examining Group Director

Questions in Cases Before the CAFC ..... Solicitor 305-9035

Express Abandonment After Issue Fee Payment ..... Office of Petitions 305-9282

Expunge Papers ..... Office of Special Program Examination 305-9384

Extensions of Time

In Court Matters ..... Solicitor 305-9035

During Pendency in Group ..... Appropriate Examining Group Director

During Pendency at Board of Patent Appeals and Interferences ..... Board of Patent Appeals and Interferences 557-4101

To Appeal to the CAFC or Commence a Civil Action ..... Solicitor 305-9035

Filing Date ..... Office of Special Program Examination 305-9384

Final Rejection, Premature ..... Appropriate Examining Group Director

Interferences

Institute an Interference ..... Appropriate Examining Group Director

Access to Applications, Unopened Preliminary Statements . Board of Patent Appeals and Interferences 557-4007

From Action by a Primary Examiner or an Interlocutory Action ..... Board of Patent Appeals and Interferences 557-4007

Late Settlement Papers ..... Board of Patent Appeals and Interferences 557-4007

Priority Papers in Patent Application ..... Board of Patent Appeals and Interferences 557-4007

Reconsideration of Decision on Motion ..... Board of Patent Appeals and Interferences 557-4007

Issuance, Defer ..... Office of Petitions 305-9282

Late Payment
Issue Fee ..... Office of Petitions 305-9282

Maintenance Fee ..... Office of Petitions 305-9282

License to File in Foreign Countries
Director, Group 2200 308-1721

Limited Recognition to Prosecute
Specified Application(s) .... Committee on Enrollment 308-9618

Make Special
Prospective Manufacture, Infringement ..... Office of Special Program Examination 305-9384

Within Jurisdiction of Board of Patent Appeals and Interferences ..... Board of Patent Appeals and Interferences 557-4101

Applicant's Age or Health, Environment Quality Program, Special Examining Procedure (accelerated examination), Energy Program, Recombinant DNA, Superconductivity ..... Appropriate Examining Group Director

Priority Papers, Return of ..... Appropriate Examining Group Director

Priority Papers, After Payment of Issue Fee ..... Office of Petitions 305-9282

Public Use Proceedings ..... Office of Special Program Examination 305-9384

Registration to Practice Before the PTO ..... Enrollment and Discipline 308-9617

Rehearing, Reconsideration, or Modification of Board Decision ..... Board of Patent Appeals and Interferences 557-4101

Rejection, Premature Final ..... Appropriate Examining Group Director

Reopen Prosecution After Decision by Board of Patent Appeals and Interferences ..... Appropriate Examining Group Director

Restriction Requirement ..... Appropriate Examining Group Director

Revive an Abandoned Application .... Office of Petitions 305-9282

Statutory Invention Registration (SIR) ..... Group 2200 308-0766

Supervisory Authority of Commissioner, Invoke in Matters Concerning the Office of Public Services and Administration ..... Office of Petitions 305-9282

Supervisory Authority of Commissioner, Invoke in Matters Concerning the Patent Examining Operation ..... Office of Petitions 305-9282

Suspension of Action
Second or Subsequent ..... Appropriate Examining Group Director

Suspension of Rules Relating to the Examining of Patent Applications .. Office of Petitions 305-9282

Suspension of Rules in Patent Matters Administered by the Office of Public Services and Administration ..... Office of Petitions 305-9282

Withdraw from Issue ..... Office of Petitions 305-9282

Protest Against Pending Patent Applications 305-9384

Public Service 308-HELP/4357

Telecommunication Device for the Deaf (TDD) 305-7785

Public Service Window (Patent Search Room) 308-1057

Reconstruction of Files 308-9726

Record Room (Patented and Abandoned Files)
(See Files - File Information Unit)

Reexaminations

Address mail to:

Commissioner of Patents and Trademarks
Box Reexam
Washington, DC 20231

General Questions 308-1202
Reexamination Examiners ..... Appropriate Examining Group
Reexamination Petitions ..... Office of Special Program Examination 305-9384
Reexamination Pre-processing 308-1202

Refunds (See Fees)

Reissues

Divisional ..... Office of Special Program Examination 305-9384

Specific Applications ..... Appropriate Examing Group

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Commissioner of Patent and Trademarks
Box 7
Washington, DC 20231

Search Room, Patent

Reference to Patents and Indices 308-0595
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Search Room, Patent Assignments

(Hours: Weekdays, 8:30 a.m. to 5:00 p.m., EST/EDT) 308-2768

Secrecy Orders 308-1720

Simultaneous Issuances 305-8594

Status of Patents 308-7004

Statutory Invention Registrations (SIRs)

General Questions 308-0766
SIR Examiners 308-0766

Subclass Listings 308-0322

Subscription Information

MPEP on CD-ROM or Disc 308-0322

MPEP paper version ..... (202) 783-3238
Patent Copy Sales 305-4350

Technology Assessment and Forecast Program Patent Statistics 308-0322

Terminal Disclaimers 305-8408

Training for Public Users, Automated Search Systems (Public User Training Branch) . 308-3924

Trademark

Affidavits

Of Use (Section 8) ..... Post Registration Team 308-9500
Of Incontestability (Section 15) Post-Registration Team 308-9500
Correction to Registration (Section 7) ..... Post-Registration Team 308-9500

Amendments

After Publication or Allowance ..... Quality Review Clerk 308-9400 (Ext. 23)
After Registration ..... Post Registration Team 308-9500
General Information ..... Public Service Branch 308-HELP/4357
Specific Pending Application ... Appropriate Law Office

Appeals

Trademark Trial and Appeal Board (TTAB) Final Refusal by Examining Attorney 308-9300

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Power of Attorney Re Pending Applications ..... Appropriate Law Office
Pre-Examination ..... 308-9400 (Ext. 22)
Status of Pending Applications 305-8748
Status of Registered Files 305-8748

Assignments

Changes Affecting Title of Pending Applications and Registered Files ..... Assignment Branch 308-9723

Information Concerning Pending Trademarks Assignments 308-9723

Search Information 308-9855

Cancellations

Registration ..... Trademark Trial and Appeal Board 308-9300

Voluntary Surrender of Registration ..... Post-Registration Team 308-9500

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Concurrent Use Proceeding ..... Trademark Trial and Appeal Board 308-9300

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Pending Applications ..... Appropriate Law Office
Registrations 308-9500

Depository Libraries, Patent and Trademark (PTDLs) 308-3924

Fees

Fee Rates 308-HELP/4357
Fee Receipts 308-0904
General Information 308-HELP/4357
Refunds 305-4229

Files

Pending Trademark Applications ..... Appropriate Law Office

Filing Receipts

Corrections ..... 308-9400 (Exts. 44, 45, 47 & 48)
Specific Information Regarding Filing Receipt ..... 308-9400 (Exts. 45, 46, 47, 48 & 49)

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New Certificates 308-9500

Oppositions (TTAB) 308-9300

Patent and Trademark Depository Library Program (PTDLP) 308-3924

Petitions

Abandoned Applications To Revive, ... Petitions and Classification Attorney 308-9000 (Ext. 29)

Application Special, To Make ..... Petitions and Classification Attorney 308-9000 (Ext. 29)

All Other Trademark .... Trademark Legal Administrator 305-9464

Post-Registration Information 308-9500

Protests, Letters of ..... Petitions and Classification Attorney 308-9000 (Ext. 29)

Public Service Branch 308-HELP/4357

Public Service Window (Trademark Search Library) 308-9811

Reconstruction of Files ..... 308-9400 (Ext. 23)

Refunds (See Fees)

Renewal, Registrations 308-9500

Search Library
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Status of Registrations and Applications via Automated Voice System
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Trademark Manual of Examining Procedures (TMEP) ..... 308-9000 (Ext. 43)

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PATENT NOTICES

Certificates of Correction For Week of January 26, 1993

Des. 317,088	4,985,189	5,021,789	5,045,153
Des. 318,167	4,987,294	5,022,216	5,045,252
Des. 318,349	4,987,933	5,022,335	5,045,540
Des. 318,583	4,989,063	5,022,348	5,046,370
Des. 320,459	4,989,437	5,024,505	5,047,641
4,661,530	4,990,201	5,024,840	5,048,034
4,779,265	4,990,247	5,024,977	5,048,261
4,846,150	4,991,366	5,025,045	5,049,020
4,862,037	4,992,461	5,026,533	5,049,535
4,866,707	4,993,419	5,026,708	5,050,031
4,869,523	4,993,918	5,026,910	5,050,981
4,879,054	4,994,899	5,027,171	5,051,752
4,885,171	4,995,360	5,027,868	5,052,210
4,896,576	4,996,308	5,028,153	5,052,214
4,900,228	4,997,959	5,028,384	5,052,419
4,921,670	4,999,726	5,028,683	5,052,998
4,925,793	5,000,824	5,029,926	5,053,108
4,927,276	5,002,729	5,030,482	5,053,250
4,937,174	5,004,215	5,030,715	5,053,667
4,938,971	5,006,143	5,031,027	5,053,766
4,940,225	5,006,733	5,032,166	5,053,821
4,943,982	5,006,973	5,032,558	5,053,878
4,947,275	5,008,693	5,033,395	5,054,386
4,948,975	5,009,563	5,033,593	5,054,418
4,957,646	5,009,770	5,033,603	5,055,127
4,960,378	5,010,387	5,034,175	5,055,506
4,960,561	5,010,691	5,035,412	5,055,512
4,961,144	5,012,270	5,036,163	5,055,518
4,961,585	5,012,413	5,036,199	5,055,572
4,961,986	5,012,677	5,036,239	5,055,813
4,963,555	5,013,137	5,036,255	5,056,032
4,965,977	5,013,182	5,036,384	5,056,079
4,967,306	5,013,371	5,037,053	5,056,102
4,967,439	5,013,885	5,037,624	5,056,748
4,968,828	5,015,633	5,037,898	5,057,019
4,969,391	5,015,729	5,039,582	5,057,295
4,970,276	5,017,770	5,039,679	5,071,005
4,971,856	5,017,777	5,040,649	5,071,587
4,974,097	5,019,247	5,040,975	5,075,294
4,978,287	5,019,871	5,041,220	5,077,326
4,978,499	5,020,272	5,041,954	5,084,075
4,980,016	5,020,388	5,042,341	5,133,619
4,980,198	5,020,831	5,043,402	5,149,691
4,980,234	5,021,624	5,043,448	
4,984,222	5,021,661	5,043,970	
4,984,347	5,021,786	5,044,775	

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ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	6/15/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	9/09/90
MECHANICAL EXAMINING GROUPS		
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MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	3/24/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	4/03/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	1/07/92

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during December 1992 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

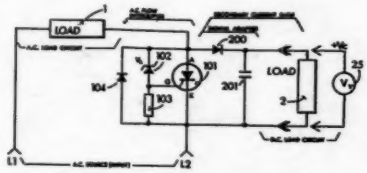
Patents ..... Numbers 3,922,721 to 3,930,270 inclusive
Plant Patents ..... 3,812 to 3,823

REEXAMINATIONS

JANUARY 26, 1993

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,300,090 (1907th)
DIRECT CURRENT POWER SUPPLY
Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770
Reexamination Request Nos. 90/002,061, Jun. 21, 1990 and 90/002,319, Apr. 12, 1991.
Reexamination Certificate for Patent No. 4,300,090, issued Nov. 10, 1981, Ser. No. 16,932, Mar. 2, 1979.
Int. Cl.[5] G05F *3/02*
U.S. Cl. 323—311



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–9** are determined to be patentable as amended.

Claims **10** and **11**, dependent on an amended claim, are determined to be patentable.

New claims **12–17** are added and determined to be patentable.

1. Power supply means [adapted to provide] *producing* a stable source of direct current power from a substantially unstable *source of* alternating current [source means, including in combination] *power comprising:*

a. [a] source of alternating current (a.c.) *power;*

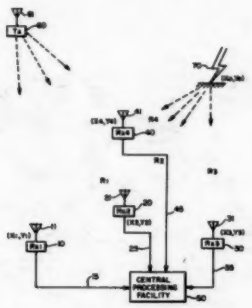
b. [an] a.c. load means;

c. a.c. [flow] *circuit* interrupter means including [an] input [effectively coupled to said] *and output terminals seriately coupled with the* a.c. *power* source and [an output effectively coupled to said] *the* a.c. load means, [producing] *effective to produce* at least a state of high impedance and low impedance therebetween, *whereby* said high impedance *is* effective to substantially interrupt the alternating-current power flow between the said input [thereto and the said output therefrom, thereby producing] *and output terminals and permit a voltage level to develop and produce* an interrupter signal substantially between the [said] input and the [said] output *terminals* for at least a small percentage of at least one half of each [successive acted upon full] a.c. *power* cycle, with the so-produced interrupter signal magnitude having an instantaneous retarded value which is substantially proportional to the value of the a.c. source signal modified by [the] ratio of [the] impedance through the a.c. load means effectively in series with [the] impedance of a d.c. load means;

d. control means [including a] *comprising* voltage responsive means coupled to said interrupter means and operative therewith to abruptly induce said state of low impedance [thereacross] when the [said] *voltage level of the* interrupter signal [magnitude] reaches a predetermined value[,] thereby limiting [said] *further increase of the* interrupter signal magnitude [to at least not substantially exceed said predetermined value, whereby further said low impedance effects a maximum] *and produce substantially full* coupling of a.c. power between [said] *the power* source and [said] *the* a.c. load *means*; and

e. secondary current path means[,] coupled to [said] *the* interrupter means[, further including] *and comprising* signal adaptive means operative with [said] the interrupter signal [so as] to provide a substantially stable, and usually low, direct current (d.c.) value [therefrom] at an output terminal means.

B1 4,543,580 (1908th)
SYSTEM FOR LIGHTNING GROUND STROKE POSITION BY TIME OF ARRIVAL DISCRIMINATION
Rodney B. Bent, Indialantic, and Paul W. Casper, West Melbourne, both of Fla., assignors to Atlantic Scientific Corporation, Melbourne, Fla.
Reexamination Request No. 90/002,625, Jan. 27, 1992.
Reexamination Certificate for Patent No. 4,543,580, issued Sep. 24, 1985, Ser. No. 339,789, Jan. 15, 1982.
Int. Cl.[5] G01S *1/44, 1/24*
U.S. Cl. 342—460



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **3** is cancelled.

Claims **1**, **11** and **14** are determined to be patentable as amended.

Claims **2**, **4–10**, **12**, **13** and **15–30**, dependent on an amended claim, are determined to be patentable.

New claims **31–35** are added and determined to be patentable.

1. A system for locating the position of the emission of a prescribed natural electrical disturbance comprising:

[a plurality of] *at least four* non collinear first means defining a perimeter, respectively situated at spaced apart geographical locations, for detecting said emission and encoding the occurrence of said emission, *at each first means, into a timing data signal representative of the time of arrival of said emission* in terms of a *single* common timing *reference* source *among the first means*; and

second means, coupled to said first means, for deriving, from said [encoded occurrences, the] *timing data signal from at last three of said at least four non collinear first means, a true* position *fix* of said emission irrespective of whether

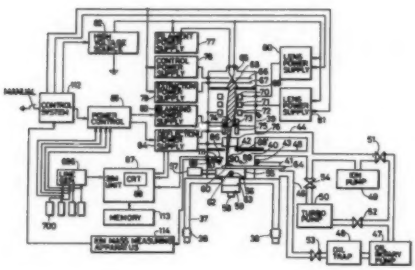
said emission occurred within or outside the perimeter bounded by said spaced apart geographical locations.

B1 4,609,809 (1909th)

METHOD AND APPARATUS FOR CORRECTING DELICATE WIRING OF IC DEVICE

Hiroshi Yamaguchi, Fujisawa; Akira Shimase, Yokohama; Tateoki Miyauchi, Yokoha, and Mikio Hongo, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Reexamination Request No. 90/002,655, Feb. 28, 1992.
Reexamination Certificate for Patent No. 4,609,809, issued Sep. 2, 1986, Ser. No. 590,344, Mar. 16, 1984.
Claims priority, application Japan, Mar. 16, 1983, 58-42126
Int. Cl.[5] B23K *15/00*
U.S. Cl. 219—121.35



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–21** is confirmed.

New claims **22–24** are added and determined to be patentable.

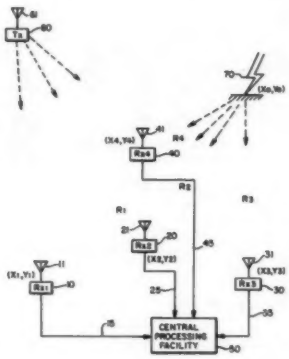
13. An apparatus for correcting a device comprising:
a specimen chamber formed inside a vacuum vessel;
a table for placing a specimen thereon, disposed inside said specimen chamber;
an ion source having a high brightness, such as provided by a liquid metal ion source, and disposed inside said vacuum vessel so as to oppose said specimen chamber;
means for extracting an ion beam from said ion source;
a charged particle optical system for focusing said ion beam thus extracted onto said specimen; and
means for controlling the output of said ion beam, the spot diameter and the radiating direction of the spot so as to radiate said ion beam onto a wiring portion of a device, including a scanning ion microscope unit for visually observing said specimen during radiation of said ion beam onto said specimen.

B1 4,792,806 (1910th)

LIGHTNING POSITION AND TRACKING METHOD

Rodney B. Bent, Indialantic, and Paul W. Casper, West Melbourne, both of Fla., assignors to Atlantic Scientific Corporation, Melbourne, Fla.

Reexamination Request No. 90/002,626, Jan. 27, 1992.
Reexamination Certificate for Patent No. 4,792,806, issued Dec. 20, 1988, Ser. No. 766,466, Aug. 19, 1985.
Continuation-in-part of Ser. No. 339,789, Jan. 15, 1982, Pat. No. 4,543,580
The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.
Int. Cl.[5] G01S *1/44, 1/24*
U.S. Cl. 342—465



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2**, **4** and **9** are determined to be patentable as amended.

Claims **3**, **5–8** and **10** dependent on an amended claim, are determined to be patentable.

New claims **11** and **12** are added and determined to be patentable.

1. A method for detecting emissions from a source of electrical radiation in an atmosphere and providing an indication of the geographic position of said source, said method comprising the steps of:

(a) stationing at least [three] *four* non collinear receivers at known geographic locations, each receiver being positioned in spaced relation to the other receivers;

[(b) encoding a signal at each receiver representative of the time of arrival of an emission from said source in relation to a common timing source;]

(b) receiving an emission from said source at each of said at least four receivers;

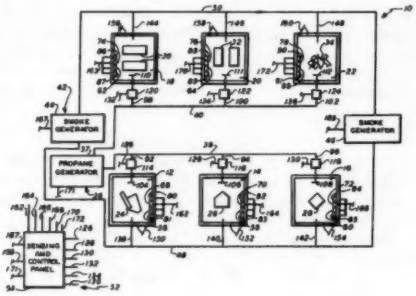
(c) *encoding, at each receiver, the receipt of said emission into a timing data signal representative of the time of arrival of said emission from said source in relation to a single common timing reference source among the receivers;* [(c)] *(d)* transmitting each encoded *timing data* signal from each of said receivers to a central facility; and thereafter [(d)] *(e)* processing at said central facility said encoded signals *from at least three of said at least four receivers* for deriving [the] *a true* position *fix* of said source irrespective of whether said emission occurred within or outside a perimeter bounded by said spaced-apart receivers.

B1 4,861,270 (1911th)

FIRE FIGHTING TRAINER

James Ernst, Livingston; Steven Williamson, Haledon; George Rogers, Linden, and Dominick Musto, Middlesex, all of N.J., assignors to Symtron Systems, Inc., Fair Lawn, N.J.

Reexamination Request No. 90/002,513, Nov. 21, 1991.
Reexamination Certificate for Patent No. 4,861,270, issued Aug. 29, 1989, Ser. No. 238,453, Aug. 30, 1988.
Int. Cl.[5] G09B *9/00*
U.S. Cl. 434—226



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1,2** and **7** are determined to be patentable as amended.

Claims **3–6** dependent on an amended claim are determined to be patentable.

1. A fire fighting trainer comprising:

a plurality of chambers having respective contents including items chosen from a group of items including furniture and fixtures and equipment;

a smoke generating means having a plurality of outlets disposed in the respective chambers;

a flame generating means having a plurality of outlets disposed in the respective chambers; and

a sensing and control means having a plurality of sensor assemblies disposed in the respective chambers and each sensor assembly connecting to a main control panel, wherein

each said sensor assembly includes a multi-agent sensor unit comprising:

a collection funnel for receiving an extinguishing medium portion;

a separation means for separating out foam from the extinguishing medium portion;

a foam chute connecting to the collection funnel;

a sonic beam source and detector mounted inside the foam chute for sensing the presence of foam in the chute;

an outlet pipe connecting to the collection funnel with an outlet opening disposed below the separation means;

a magnetostrictive fluid sensor unit mounted on and extending into the outlet pipe above the outlet opening for sensing the presence of water in the outlet pipe; and

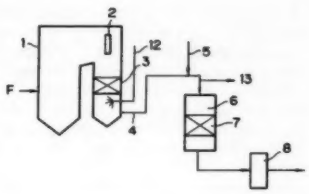
an infrared source and detector mounted inside the collection funnel for **[**sending**]** *sensing* the **[**the**]** presence of a cloud of powder in the collection funnel.

B1 4,869,735 (1912th)

ADSORBENT FOR ARSENIC COMPOUND AND METHOD FOR REMOVING ARSENIC COMPOUND FROM COMBUSTION GAS

Masaki Miyazawa; Norihisa Kobayashi, both of Tokyo; Hiromu Takatsuka, Nagasaki; Atsushi Morii, Nagasaki; Toshio Koyanagi, Nagasaki; Touru Seto, Hiroshima; Kozo Iida, Hiroshima; Shigeaki Mitsuoka, Hiroshima; Hiroaki Rikimaru, Osaka; Makoto Imanari; Takeo Koshikawa, both of Ibaragi; Akihiro Yamauchi, Koganei; Masayuki Hanada, Kitakyushu; Morio Fukuda, Kitakyushu, and Kiyoshi Nagano, Kitakyushu, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo; Sakai Chemical Industry Co., Ltd., Osaka; Mitsubishi Petrochemical Co., Ltd., Tokyo; Mitsubishi Petrochemical Engineering Co., Ltd., Tokyo and Catalysts & Chemicals Industries Co., Ltd., Tokyo, all of, Japan

Reexamination Request No. 90/002,632, Feb. 6, 1992.
Reexamination Certificate for Patent No. 4,869,735, issued Sep. 26, 1989, Ser. No. 187,470, Apr. 28, 1988.
Claims priority, application Japan, Apr. 30, 1987, 62-104447
Int. Cl.[5] B01D *19/00, 53/02*
U.S. Cl. 55—72



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **2** are determined to be patentable as amended.

Claims **3–5**, dependent on an amended claim, are determined to be patentable.

1. A method for removing arsenic oxides from a combustion exhaust gas *which contains arsenic oxides* which comprises the step of injecting an adsorbent for arsenic oxides into **[**a**]** *said* combustion exhaust gas on the upstream side of an ammonia reducing denitrating catalyst, said adsorbent being such that the total volume of pores is 0.2 to 0.7 **[**cc g**]** *cc/g* and the volume of the pores having a pore diameter of 300 Å or more is 10% or more with respect to the total pore volume.

B1 4,872,483 (1913th)

CONVENIENTLY HAND HELD SELF CONTAINED ELECTRONIC MANOMETER AND PRESSURE MODULATING DEVICE

Nyan S. Shah, Mentor, Ohio, assignor to International Medical Products, Inc., Mentor, Ohio.

Reexamination Request No. 90/002,015, Apr. 30, 1990.
Reexamination Certificate for Patent No. 4,872,483, issued Oct. 10, 1989, Ser. No. 140,121, Dec. 31, 1987.
Int. Cl.[5] A61M *16/04*
U.S. Cl. 137—557

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **5–7** is confirmed.

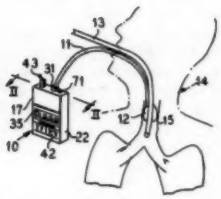
Claims **1–4** are cancelled.

[1. An electronic manometer assembly for use in monitoring pressure at a site in the body of a patient comprising:

a numerical read-out unit having a size adapted to be conveniently held in the palm of the hand of a user, said numerical read-out unit having an output passage therein;

manually digitally operable pump means contained in said numerical read-out unit in fluid communication with said output passage for generating a pressure head;

delivery means in fluid communication with said output passaage and adapted for insertion in a patient for delivering said pressure head from said output passage to said site in said patient said delivery means terminating in an enclosed, inflatable cuff;



electronic pressure transducer means in said numerical read-out unit in fluid communication with said output passage for generating an electrical signal corresponding to the pressure in said cuff of said delivery means;

electronic display means in said numerical read-out unit electrically connected to said transducer means for visually displaying a number corresponding to said electrical signal and thus to said pressure in said cuff of said delivery means; and

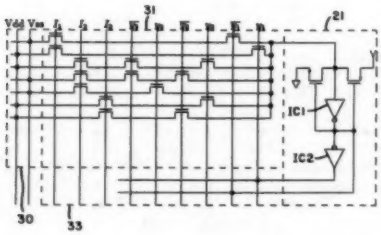
power supply means contained within said numerical read-out and electronically connected to said electronic pressure transducer means and to said electronic display means for supplying electrical power thereto.]

B1 4,912,348 (1914th)

METHOD FOR DESIGNING PASS TRANSISTOR ASYNCHRONOUS SEQUENTIAL CIRCUITS

Gary K. Maki, and Sterling R. Whitaker, both of Moscow, Id., assignors to Idaho Research Foundation, Moscow, Id.

Reexamination Request No. 90/002,556, Feb. 19, 1992.
Reexamination Certificate for Patent No. 4,912,348, issued Mar. 27, 1990, Ser. No. 282,308, Dec. 9, 1988.
Int. Cl.[5] H04Q *1/00;* **H03K** *17/693, 19/096, 3/01*
U.S. Cl. 307—465



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 20 are determined to be patentable as amended.

Claims 2–19 and 21–39, dependent on an amended claim, are determined to be patentable.

1. A method for designing an asynchronous sequential circuit comprising a pass transistor network, including the steps of:

(a) generating a flow table indicative of [the] desired characteristics of the circuit, and encoding each present state variable, y_k, of the flow table with a state assignment; and

(b) generating from the encoded flow table a *partial* circuit design for each next state variable, Y_i, of the circuit, wherein each said *partial* circuit design corresponds to a portion of the pass transistor network receiving a set of l input signals I_j, and wherein each said partial circuit design has form

$$Y_i = \sum_{j=1}^{l} \sum_{k=1}^{m_j} p_k I_j(x_{kj})$$

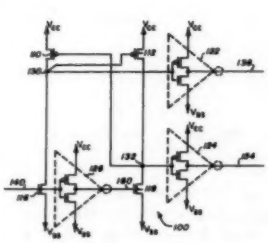
where $p_k I_j(X_{kj})$ represents a pass transistor path which decodes a transition path to a stable state S_k under one of said input signals I_j, bit X_{kj} is [the] *a* jth bit of state S_k, each p_k is a partition of the present state variables under said input signal I_j, and m_j is the number of partitions under said input signal I_j.

B1 4,916,337 (1915th)

TTL TO CMOS LOGIC LEVEL TRANSLATOR

Wingyu Leung, Cupertino, and Winston K. M. Lee, San Francisco, both of Calif., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.

Reexamination Request No. 90/002,557, Feb. 19, 1991.
Reexamination Certificate for Patent No. 4,916,337, issued Apr. 10, 1990, Ser. No. 320,312, Mar. 7, 1989.
Int. Cl.[5] H03K *19/092, 19/094, 19/20, 17/04*
U.S. Cl. 307—475



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–5 are cancelled.

[1. A TTL to CMOS logic level translator comprising in combination:

a pair of nodes including a first node and a second node;

an output line coupled to a predetermined one of said pair of nodes;

inverter means having an input connected to said input line and an output;

a first transistor having source means connected to receive a first power supply potential, drain means connected to said first node, and a gate connected to said second node;

a second transistor having a gate connected to said input line, drain means connected to said first node, and source means connected to receive a second power supply potential;

a third transistor having source means connected to receive said first power supply potential, drain means connected to said second node, and a gate connected to said first node;

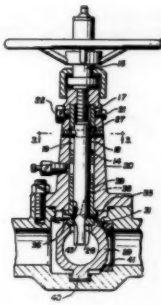
a fourth transistor having a gate connected to said inverter output, drain means connected to said second node, and

source means connected to receive said second power supply potential.]

B1 4,917,354 (1916th)
DUAL ACTION BALL VALVE

James F. Chambers, Little Rock, Ark., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Reexamination Request No. 90/002,347, May 16, 1991.
Reexamination Certificate for Patent No. 4,917,354, issued Apr. 17, 1990, Ser. No. 295,452, Jan. 10, 1989.
Int. Cl.[5] F61K *5/06*
U.S. Cl. 251—163



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** and **3** are determined to be patentable as amended.

Claim **2**, dependent on an amended claim, is determined to be patentable.

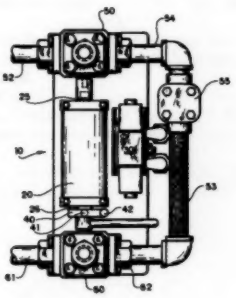
New claims **4–8** are added and determined to be patentable.

1. In a dual-action ball valve of the type wherein a valve stem is mounted in a valve bonnet and a bonnet bushing and threadably connected at its upper end to a drive nut connected to a hand wheel and its lower end slidably received in the ball valve, whereby initial rotation of the hand wheel to open the valve causes the ball valve to move away from the valve seat and continued rotation causes the ball valve to rotate 90° to the open position, the improvement comprising a sleeve fixedly mounted within the valve bonnet and surrounding the valve stem, *said stem being slidable in the sleeve, said sleeve being readily removable and replaceable,* a pair of spiral slots provided in the side wall of said sleeve, *said slots extending through the side wall of said sleeve and each having at least one closed end,* a transverse guide pin mounted in the valve stem and having its opposite end portions extending into the sleeve slots, an insert member mounted on the upper wall of the ball valve, said insert member comprising a disc having an aperture, the lower end of said valve stem extending through said aperture, said aperture having tapered bearing wall surfaces cooperating with sloping cam surfaces in the lower end portion of the valve stem, and arcuate members integrally formed on the upper surface of the insert adjacent each end of the aperture and engaging the lower end of the valve bonnet bushing to thereby provide a trunnion, whereby the ball valve is tilted relative to the valve seat during the sliding movement of the stem cam surfaces relative to the tapered bearing surfaces in the insert.

B1 5,056,559 (1917th)
PURGE VALVE ASSEMBLY

Francis H. Golembiski, 24 W. Main St., Box 87, Elverson, Pa. 19520

Reexamination Request Nos. 91/002,739, Jun. 1, 1992 and 91/002,747, Jun. 8, 1992.
Reexamination Certificate for Patent No. 5,056,559, issued Apr. 25, 1989, Ser. No. 531,908, May 31, 1990.
Int. Cl.[5] F16K *11/076*
U.S. Cl. 137—595



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

1. A purge valve assembly for purging a burner in a pressure boiler comprising a single fluid driven rotary actuating cylinder having a rotor which rotates on a shaft from a mechanical stop at first or zero degrees position through a pneumatic stop at second or 90 degrees position to a mechanical stop at third or b **180** degrees position, the shaft having upper and lower ends which extend exteriorly through the cylinder's housing, the upper end being coupled to a first three-way valve for controlling the flow of steam and the lower end coupled to a second three-way valve for controlling the flow of fuel, the first and second valves being coupled to the rotor shaft such that when the rotor is in the third or 180 degrees position steam and fuel shall pass through both valves to the burner, when the rotor is in the second or 90 degree position steam only shall pass to the burner and when the rotor is in the first or zero degrees position neither steam nor fuel shall pass to the burner.

REISSUES

JANUARY 26, 1993

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,166

FUEL PROCESSOR APPARATUS FOR DIESEL ENGINE POWERED VEHICLES

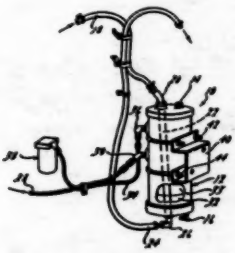
Leland L. Davis, San Antonio, Tex., assignor to Davco Manufacturing Corporation, Saline, Mich.

Original No. 4,421,090, dated Dec. 20, 1983, Ser. No. 435,681, Oct. 21, 1982. Continuation of Ser. No. 188,875, Sep. 19, 1980, Pat. No. 4,368,716. Application for reissue Oct. 9, 1990, Ser. No. 594,415

The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.[5] F02M *31/00*; B01D *23/00*

U.S. Cl. 123—557 **4 Claims**



1. A fuel processor means for use with diesel engines on diesel trucks, automobiles, and the like, and whereby said fuel processor means is operative to [preheat] *heat* the diesel fuel and to separate out water-impurities from the diesel fuel, *and for melting wax crystals which form in cold ambient conditions before the fuel is transmitted to a particulate filter and enabling the diesel fuel to be used in cold ambient conditions without the use of fuel additives such as chemicals or lighter grade fuels to improve fuel flowability,* comprising:

a vertically oriented tubular vessel means *which provides for a substantially unconstrained flow path of the diesel fuel therethrough* operative for separating *the* water out of the fuel, *and collecting the water-impurities at the bottom of said vessel means,*

first inlet conduit means [to introduce] *for introducing* hot liquid from the engine *to said vessel means,*

[another] *a heat exchange* conduit means passing *from said first inlet conduit means* through a central portion of said vessel *means and into said bottom of said vessel means* for transmitting the hot liquid therethrough,

first outlet conduit means for recirculating the hot liquid *from said heat exchange conduit means* back through the engine system,

a second inlet conduit means for introducing *unprocessed* fuel [to] *into* the interior of [the] *said* vessel *means* near the *vertical* midpoint thereof for flow therethrough [and such that this inlet is above the level of water-impurities being collected in the vessel,] *whereby said separation of the water-impurities provided by said fuel processor means begins to occur after the fuel enters from said second inlet conduit means into said vessel means,*

a second outlet conduit means for the fuel near the top of [the] *said* vessel *means* for transmitting the water-free fuel to *the particulate filter and* the engine *whereby said second inlet conduit means and said outlet conduit means cause the fuel to flow through said vessel means in a manner which facilitates the separation of the water-impurities and minimizes remixing of the water-impurities being collected,*

drain means at [the] *said* bottom of [the] *said* vessel *means* for draining out *the* water-impurities which collect therein *to prevent water impurities collected in the bottom of said vessel means from rising to the level of said second inlet conduit means,* and

vent means near the top of [the] *said* vessel *means* for venting [the] *said* vessel *means* when desired. **20**

* * * * *

The questions raised in reexamination request No. 90/001,642, filed Nov. 22, 1988, have been considered and the results thereof are reflected in this reissue patent which constitutes the reexamination certificate required by 35 U.S.C. 307 as provided in 37 CFR 1.570(e).

Re. 34,167

DRILL BIT AND ROLLER CUTTER FOR SAID DRILL BIT

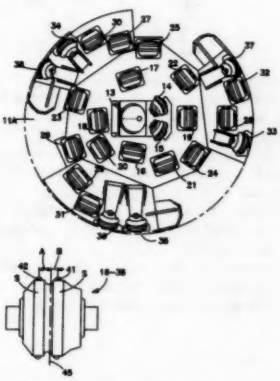
Michael Mattsson, Sandviken, Sweden, and Lars-Erik Tunell, Nelson Bay, Australia, assignors to Santrade Limited, Lucerne, Switzerland

Original No. 4,832,136, dated May 23, 1989, Ser. No. 158,097, Feb. 16, 1988. Continuation of Ser. No. 917,485, Oct. 10, 1986, abandoned. Application for reissue May 23, 1991, Ser. No. 704,810

Claims priority, application Sweden, Oct. 11, 1985, 8504711

Int. Cl.[5] E21B *10, 10, 10/16, 10/20*

U.S. Cl. 175—57 **7 Claims**



6. A reversible roller cutter comprising:

a body,

a pair of substantially identical journals extending from opposite ends of said body and defining an axis of rotation for said roller cutter, each of said journals being configured to enable said body to be reversibly mounted in a support means between first and second positions, and

first and second circumferentially extending cutting means carried by said body at equal radial distances from said axis of rotation for cutting kerfs in the rock, said first and second cutting means lying in first and second planes, respectively, oriented perpendicularly to said axis of rotation, said first and second planes being disposed parallel to a center plane of said roller cutter, said first and second planes being axially spaced apart from said center plane by first and second axial distances, respectively, said first and second distances being different, said body being devoid of cutting means at a location spaced by said first distance from said center plane in a direction opposite the direction in which said first plane is

spaced from said center plane, and said body being devoid of cutting means at a location spaced by said second distance from said center plane in a direction opposite the direction in which said second plane is spaced from said center plane, said first distance being substantially three times said second distance.

Re. 34,168

LENS-FITTED PHOTOGRAPHIC FILM PACKAGE

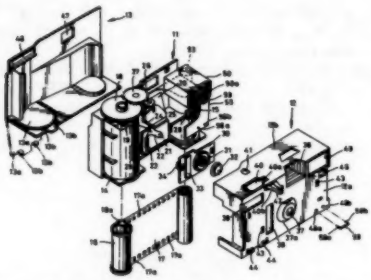
Hiroshi Ohmura; Takuya Arai; Akira Haishi; Katsuya Kozai; Hiroshi Hara, all of Tokyo; Takashi Tobioka, Saitama; Seiji Asano, Saitama, and Junichi Takagi, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Original No. 4,954,858, dated Sep. 4, 1990, Ser. No. 314,214, Feb. 22, 1989. Application for reissue Apr. 12, 1991, Ser. No. 689,000

Claims priority, application Japan, Feb. 22, 1988, 63-21932[U]; Feb. 22, 1988, 63-21935[U]; Feb. 22, 1988, 63-21936[U]

Int. Cl.[5] G03B *15/05, 17/02*

U.S. Cl. 354—145.1 **22 Claims**



7. A lens-fitted photographic film package having at least a roll of unexposed photographic film, a taking lens, and electronic flash means, as a whole contained in a case, said lens-fitted photographic film package comprising:

a main case section of said case, mounting said taking lens and said electronic flash means and containing light-tightly said roll of photographic film;

a pair of terminals mounted on said main case and electrically connected to electrodes of a condenser of said electronic flash means;

a front case section of said case, securely attached to said main case section to cover said main case section; and

at least one opening provided in said [front] case [section] so as to allow a short-circuit means access to said pair of terminals through said at least one opening for discharging said condenser.

Re. 34,169

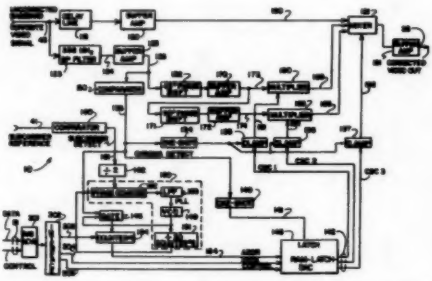
PHASE RESPONSIVE COMPOSITE VIDEO SIGNAL CONTROL SYSTEM

Michael L. Orsburn, Copper City; Robert L. Hemsky, Boca Raton, and James I. Bacon, Fort Lauderdale, all of Fla., assignors to ColorGraphics Systems, Inc., Madison, Wis.

Original No. 4,642,682, dated Feb. 10, 1987, Ser. No. 604,845, Apr. 27, 1984. Application for reissue Nov. 28, 1989, Ser. No. 442,145

Int. Cl.[5] H04N *9/64, 9/68*

U.S. Cl. 358—27 **78 Claims**



1. A phase responsive video signal correction system for correcting a video parameter of an image represented by a composite video signal, comprising:

single phase detecting means responsive to detect relative phase between a phase encoded component of an uncorrected composite video signal and a reference signal in each one of a plurality of ranges of phases representable by said composite video signal;

correction signal means responsive to said detected relative phase for [generating] *selecting one of* a *plurality of* correction [signal] *signals* related to said detected relative phase; and

means responsive to said *selected* correction signal for correcting said uncorrected composite video signal to provide a corrected composite video signal.

PLANT PATENTS

GRANTED JANUARY 26, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,114
ROSE PLANT INTERNIKI

Peter Ilsink, Leersum, Netherlands, assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Jun. 14, 1991, Ser. No. 715,342
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—28 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its ability to produce many flowering stems per square meter, each flowering stem producing a cluster of small red flowers that open simultaneously, a good vase life as a cut flower, resistance to powdery mildew, and a vigorous upright growth habit.

8,115
JAPANESE PEAR TREE "YASATO"

Kitsuo Kanato, Nagoya; Yutaka Machida; Akio Kurihara, both of Tsuchiura; Yoshihiko Sato; Kazuyuki Abe, both of Tsukuba; Ichiro Kajiura, Fujisawa; Kanetsugu Seike, Tokyo; Kazuo Kotobuki, Nakagun; Isao Shimura, Machida; Teruo Kozono, Tsukuba; Tatsushi Ogata, Minamitakaki, and Mitsuo Omura, Shizuoka, all of Japan, assignors to Fruit Tree Research Station, Ministry of Agriculture, Forestry and Fisheries, Tsukuba, Japan

Filed Mar. 12, 1991, Ser. No. 667,930
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—36 **1 Claim**

1. A new and distinct variety of Japanese pear tree, substantially as illustrated and described herein, characterized over the known Japanese pear trees by having a strong vigor, a good maintained spur, a strong resistance to scab; having dark bluish green leaves and white flowers; a large amount of fruit which has a light green yellow skin and a circular-ellipse-shape; and a flesh which is yellowish white in color, soft, crisp and very juicy, with a high sweetness, a medium acidity, no astringency, and a harvesting stage of the fruit early in the season.

8,116
NECTARINE TREE 'CHIYODARED'

Masao Yoshida, Morioka; Hidetoshi Kyotani, Tsukuba; Masami Yamaguchi, Sagae; Teruo Kozono, Tsukuba; Teruo Nishida, Mito; Yuri Ishizawa, Tsukuba; Kitsuo Kanato, Nagoya, and Koichi Nishimura, Tsukuba, all of Japan, assignors to Fruit Tree Research Station, Ministry of Agriculture, Forestry and Fisheries, Tsukuba, Japan

Filed Mar. 12, 1991, Ser. No. 667,928
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—41.1 **1 Claim**

1. A new and distinct variety of genetically nectarine (*Prunus persia*) tree, substantially as illustrated and described, which is of an early ripening cultivar, moderately vigorous, moderately spreading, foliated with large elongated yellowish-green leaves, and producing uniform, medium size, round to round-elliptic shaped, clingstone fruit having a yellow ground color and deep red over color skin, and yellow flesh which is slightly red near the pit; the variety being particularly characterized in comparison with 'Hiratsukared' (the seed parent), by fruit which ripens two weeks earlier, is slightly smaller, more sourer, and has a unique eating quality.

8,117
CHRYSANTHEMUM PLANT—FUNSET CULTIVAR

Jacques C. M. van der Knapp, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Jun. 24, 1991, Ser. No. 719,462
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Funset, substantially as herein shown and described, which:

(a) exhibits attractive relatively small anemone flowers having an overall diameter of approximately 40 mm. wherein the petals are very light-red and the disc florets particularly towards the center bear an orange-red coloration on the distal ends,
(b) bears flowers in a somewhat pyramidal configuration,
(c) exhibits a flower response period of approximately seven and one-half weeks,
(d) forms attractive dark green foliage, and
(e) has the ability to produce flowers of commercially acceptable quality throughout the year in a cut mum production program.

8,118
CHRYSANTHEMUM PLANT — IMPROVED FUNSHINE CULTIVAR

Jacques C. M. van der Knapp, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Jun. 24, 1991, Ser. No. 719,464
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Improved Funshine, substantially as herein shown and described, which:

(a) exhibits attractive relatively small anemone flowers having an overall diameter of approximately 40 mm. wherein the petals are white and the disc florets particularly towards the center bear a red coloration on the distal ends which is more intense than that present on the Funshine cultivar,
(b) bears flowers in a somewhat pyramidal configuration,
(c) exhibits a flower response period of approximately seven and one-half weeks,
(d) exhibits more vigor than the Funshine cultivar,
(e) forms attractive dark green foliage, and
(f) has the ability to produce flowers of commercially acceptable quality throughout the year in a cut mum production program.

8,119
VARIETY OF GERANIUM NAMED SARAH

Eleanor Stoots, Connellsville, Pa., assignor to Oglevee, Ltd., Connellsville, Pa.

Filed Nov. 13, 1991, Ser. No. 791,279
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct variety of Geranium plant substantially as shown and described.

336-392 O.G.-93-2

PATENTS

GRANTED JAN. 26, 1993

ERRATA

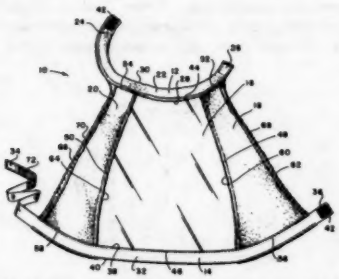
For CLASS	See PATENT NO.
019-065	5,181,295
051-287	5,181,375
604-385	5,181,563
220-618	5,181,615
205-077	5,181,770
400-708	5,181,801
362-116	5,181,927
299-001	5,181,934
504-347	5,181,952
205-213	5,182,006
210-139	5,182,008
526-125	5,182,341
526-206	5,182,342
526-240	5,182,343
548-520	5,182,392
549-004	5,182,393
549-557	5,182,394
552-251	5,182,395
552-653	5,182,396
359-720	5,182,444
315-159	5,182,502
315-224	5,182,503
315-370	5,182,504
324-663	5,182,523
392-389	5,182,567
257-382	5,182,619
257-072	5,182,620
257-546	5,182,621
257-231	5,182,622
257-230	5,182,623
257-040	5,182,624
257-443	5,182,625
257-049	5,182,627
257-707	5,182,628
257-577	5,182,629
257-787	5,182,630
257-664	5,182,631
257-713	5,182,632

PATENTS

GRANTED JANUARY 26, 1993

GENERAL AND MECHANICAL

5,181,274
CATHERER SHOWER SHIELD
Hannah B. DeFiore, 18665 Midway, #2412, Dallas, Tex. 75287
Filed Aug. 7, 1991, Ser. No. 741,681
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—46 **3 Claims**



1. A shield for protecting a catheter while a patient is taking a shower bath, comprising:
first means for engaging a first portion of a patient's body;
second means for engaging a second portion of the patient's body;
a waterproof panel spanning between the first and second means and having at least two lateral sides; and
water absorbent panels attached to the lateral sides of the waterproof panel and spanning between the first and second means.

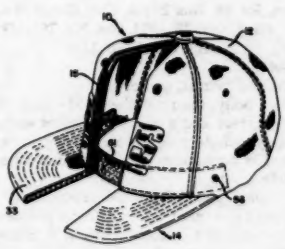
5,181,275
APRON TO BE USED IN A SEATED POSITION
Edwin A. Spulgis, 1814 Second Dr., Charleston, S.C. 29407
Filed Nov. 20, 1991, Ser. No. 794,948
Int. Cl.[5] A41B *13/10*; B60R *7/00*
U.S. Cl. 2—48 **4 Claims**

1. An apron which may be placed in a lap of a seated wearer so as to protect legs and lower torso of the wearer and to protect a seating surface on which the wearer is seated, comprising:
a. a first leg protector which is placed over a leg of a wearer and which contacts a top of the leg and an inner side of the leg of the wearer;
b. a second leg protector which is placed over a top of a remaining leg and an inner side of the remaining leg of the wearer;
c. a torso protector which is placed over a lower torso of said wearer so as to protect a lower torso of the wearer;
d. a lap protector which connects said first leg protector to said second leg protector by attachment or continuation of said first leg protector at a bottom of a part of said leg connector which covers the inner side of the leg and which connects to said second leg protected by continuation of said second leg protector at a bottom of a part of second leg protector which covers an inner side of the leg, wherein said lap protector has a bottom which rests against a seat upon which a wearer is seated and has a relatively flat top surface which allows a flat bottom of a beverage container to rest upon said lap protector; and
e. a cup which is formed where said first and second leg protectors and said lap protector join at said torso protector, wherein said cup has an open side which is between said leg protectors so as to accept a beverage container within said cup through said open side, wherein said beverage container is retained within said cup between said legs of said wearer and against said torso protector, and wherein a bottom of said beverage container rests against said lap protector.

5,181,276
INFECTION RESISTANT PRODUCTS
Jean Kersten, Villers St. Amand, and Yves A. Delmotte, Tertre, both of Belgium, assignors to Baxter International Inc., Deerfield, Ill.
Continuation of Ser. No. 484,137, Feb. 22, 1990, abandoned. This application Sep. 9, 1991, Ser. No. 759,695
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—161 R **5 Claims**

1. Polymeric infection resistant glove comprising a blend of a polymer and a heat resistant antiviral compound made by the process comprising:
a. mixing a molten blend of a polymer and a compound having a Hydrophilic Lipophilic Balance of between 12 and 20, said compound consisting of: R_1—O—$((CH_2)a_i$—O)n—R_2 where R_1 is a saturated or unsaturated hydrocarbon radical, the constituent elements selected from the group consisting of carbon, hydrogen and oxygen; a_i is, for i=to n, an integer greater than or equal to 2; R_2 is an organic radical, the constituent elements selected from the group consisting of carbon, hydrogen and oxygen n is an integer selected so that the Hydrophilic Lipophilic Balance of said compound is between 12 and 20, said compound comprising between 1 to 10% of said glove; and
b. forming said glove.

5,181,277
REVERSIBLE HAT ASSEMBLY
Gary A. Sherman, Basking Ridge, N.J., assignor to Get-A-Head, Inc., Millburn, N.J.
Filed Aug. 26, 1991, Ser. No. 749,655
Int. Cl.[5] A42B *1/04*
U.S. Cl. 2—195 **19 Claims**



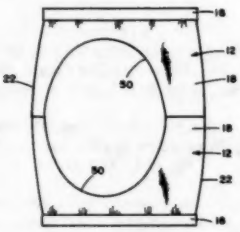
1. A reversible hat comprising:
two hemispherical crown members, one located inside the

other whereby when the hat is turned inside out the outside crown member becomes the inside crown member, and vice versa each crown member having a head-encircling outer edge and each crown member having a front portion, said crown members joined substantially only about said outer edges of said crown members to allow independent action and shaping of said crown members around a wearer's head positioned at said front portion to permit said reversible hat to maintain an outer formed hat shape in either position of reversal of said hat.

5,181,278
METHOD OF FORMING BRIEFS

Eliezer Peleg, New York, N.Y.; Michael J. Bolin, Clover, S.C.; George A. G. Browder, Jr., and Charles M. Price, both of Winston-Salem, N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Filed Jul. 9, 1991, Ser. No. 727,475
Int. Cl.[5] A41D 9/00
U.S. Cl. 2—243 R **3 Claims**



1. A method of constructing a one-piece brief comprising the steps of knitting an elongated tubular section of material, laying the tubular section flat so that a double thickness having two longitudinal edges are formed, aligning with a predetermined portion of that flat tubular section a cutting die having first curved cutting edge portions conforming in size and configuration to a predetermined pattern and defining a closed loop, and second and third cutting edge portions extending outwardly from said first curved portions and generally perpendicular to the longitudinal folded edges, die cutting the double thickness of material to sever a portion therefrom conforming to the predetermined pattern and to divide the flat tubular section into first and second brief blanks, each brief blank having first and second straight severed edge portions connected by curved peripheral edge portions, arranging a brief blank with the first straight severed edge portions in overlapping relation with the second straight severed edge portions, and sewing together the first and second severed straight edge portions to form the crotch portion and leg openings of the brief.

5,181,279
CUSHIONED HELMET

Dale T. Ross, Rd #1, Box 211-B, Coal Center, Pa. 15423

Filed Nov. 25, 1991, Ser. No. 797,379
Int. Cl.[5] A42B 3/12
U.S. Cl. 2—413 **2 Claims**

1. A cushioned helmet, comprising,

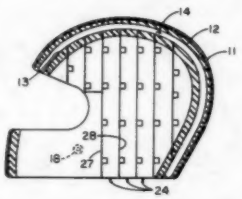
a rigid shell body, the rigid shell body including a convex exterior surface and a concave interior surface, with the shell body including a cushioned outer lining coextensive with and in contiguous communication with the interior DB surface, and

an inner lining spaced from the outer lining, wherein the inner lining and outer lining define a pneumatic chamber therebetween that is coextensively directed throughout the interior surface, and

a pneumatic pump bladder means mounted to the shell body directed exteriorly of the exterior surface thereof for effecting selective pneumatic pressurizing to the pneumatic chamber, and a pressure release valve mounted to a second side of the shell body directed through the exterior surface thereof to effect selective pressure release of the pneumatic chamber, wherein the pump bladder means and the pressure release valve are arranged in diametrically opposed relationship relative to one another, and

the shell body further includes a series of insert means for selective mounting and removal relative to the inner lining, and

the insert means includes a plurality of "U" shaped cushion inserts arranged in row, wherein each insert includes an insert outer arcuate surface in contiguous communication with the inner lining and an insert inner arcuate surface

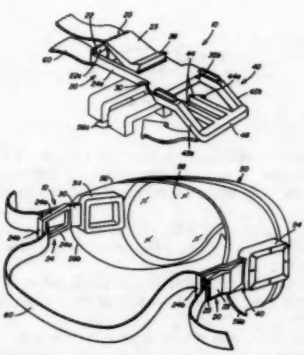


arranged for accommodation of an individual's head positioned within the shell body, and each insert including a first planar side wall spaced from and parallel to a second planar side wall, the first planar side wall includes a plurality of first side wall cavities spaced apart a predetermined spacing, and the second side wall includes a plurality of second side wall projections spaced apart a spacing equal to the predetermined spacing, wherein the first side wall cavities and the second side wall projections are orthogonally directed relative to the first planar side wall and the second planar side wall, and each first side wall cavity of said plurality of side wall cavities is in alignment with a respective second side wall projection of said plurality of second side wall projections.

5,181,280
STRAP RETAINER

Woodie M. Zachry, Jr., Spring, Tex., assignor to Encon Safety Products, Houston, Tex.

Filed Nov. 1, 1991, Ser. No. 786,256
Int. Cl.[5] A61F 9/02
U.S. Cl. 2—452 **8 Claims**



5. Safety goggles comprising:

a body adapted to conform to the face of the wearer;

retainers for attaching to each end of the strap to hold the

strap under tension and provide for quick release by the user, each retainer comprising:

a clamp having a frame and a movable cover, the frame and moveable cover cooperating to hold the retaining strap securely in place on the wearer;

the frame forming an opening through which the retaining strap is drawn and having a flange, with a beveled surface facing the opening, positioned to engage the retaining strap when it is drawn through the opening;

the moveable cover, sized to substantially cover the opening of the frame, attached to the clamp by a spring hinge, and having a serrated edge opposite the hinge, facing the beveled surface of the flange, the spring hinge adapted to urge the serrated edge against the retaining strap when the retaining strap is drawn through the opening and is in contact with the beveled surface of the flange; the movable cover further having a tab adjacent to the hinge so that depression of the tab releases the retaining strap from the clamp;

a central segment connected to the frame of the clamp forming one end of the opening, the frame having two longitudinal side members contiguous with and extending from the central segment and an end opposite the central segment joining the two side members and carrying the beveled flange; and

a means for attaching the retainers to the goggles.

5,181,281

DEVICE FOR CONTROLLING DISSOLUTION OF A SOLID CLEANSER

Ren-Yue Jang, 1F, No. 13, Alley 3, Lane 82, Fu-Hsing Rd., Taipei, Taiwan

Filed Jan. 24, 1992, Ser. No. 825,012
Int. Cl.[5] E03D *9/02*
U.S. Cl. 4—227.2 **5 Claims**

1. A device to be placed in a water tank for controlling the dissolution of a solid cleanser, said device comprising:

a housing including a weighed closed base to sink said housing to a bottom of said water tank, a surrounding wall detachably connected to said base and a top opening, said surrounding wall having an upper section and a perforated lower section;

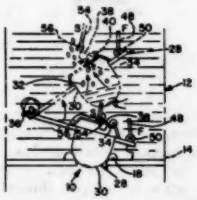
a floating container for receiving said solid cleanser therein, said floating container being movably provided in said housing and including a closed bottom having a peripheral edge, a perforated surrounding wall connected to said closed bottom, a top access opening and a cover detachably connected to said perforated surrounding wall so as to close said access opening, said floating container floating upwardly inside said housing when said water tank is filled with water such that said cover blocks said top opening of said housing and said peripheral edge of said closed bottom abuts against an inner surface of said upper section of said surrounding wall so as to interrupt fluid communication between said floating container and the exterior of said housing and to prevent water from entering into said floating container, thereby preventing excessive dissolution of said solid cleanser.

5,181,282

SEMI-FLUSH FLAPPER VALVE

Joseph Comparetti, 23 Cedar Grove Ave., Lake Grove, N.Y. 11755

Filed Nov. 6, 1991, Ser. No. 788,561
Int. Cl.[5] E03D *1/35*
U.S. Cl. 4—404 **5 Claims**



1. A semi-flush flapper valve apparatus for use in a toilet of the type having a tank, a flush port, a valve seat and an overflow tube, said apparatus comprising:

a) an operating handle rotatively mounted to the toilet tank, so that the operating handle can rotate both in a first direction and in a second direction;

b) a main flapper valve having a bottom chamber for trapping air therein and a top air release hole, said main flapper valve is pivotally mounted at one end to the overflow tube, so as to normally sit upon the valve seat over the flush port with said bottom chamber communicating with said flush port;

c) a bleeder valve which is pivotally mounted at one end onto said main flapper valve to normally cover the top air release hole;

d) a first means, coupled between said operating handle and said main flapper valve, for causing a conventional full flush cycle in the toilet tank, when said operating handle is rotated in a first direction on the toilet tank, so as to pivot said main flapper valve about said one end while said bleeder valve remains closed over said air release hole;

e) a second means, coupled between said operating handle and another end of said bleeder valve, for causing a semi-flush cycle in the toilet tank, when said operating handle is rotated in a second direction on the toilet tank, whereby said bleeder valve will pivot about said pivotal mounting to open said air bleeder hole and pull up said main flapper valve, allowing said main flapper valve to subsequently close faster than normal onto the valve seat due to lack of buoyancy thereof.

5,181,283

COLLAPSIBLE SKIMMER

Hendrik C. Gillebaard, 22192 Paso del Sur, South Laguna Beach, Calif. 92677

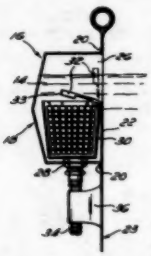
Continuation-in-part of Ser. No. 566,146, Aug. 9, 1990, Pat. No. 5,083,327. This application Feb. 4, 1991, Ser. No. 650,768
Int. Cl.[5] E04H *4/00*
U.S. Cl. 4—496 **6 Claims**

1. A collapsible skimmer for use within an above-the-ground swimming pool comprising:

a flexible, collapsible, flaccid enclosure defining an interior chamber having an upper portion and a lower portion, said enclosure being sized to be positionable over an inlet port disposed within a side wall of said pool and attachable to said side wall such that a substantial part of said upper portion and all of said lower portion of said interior

chamber are in constant fluid communication with water contained within said pool;

an outlet port disposed within said enclosure, said outlet port being in fluid communication with said lower portion of said interior chamber; and



a weir basket disposed within said lower portion of said interior chamber, said weir basket being formed to provide structural support to said enclosure and being positionable over said outlet port in a manner wherein water entering said enclosure will pass through said weir basket and out said outlet port.

5,181,284

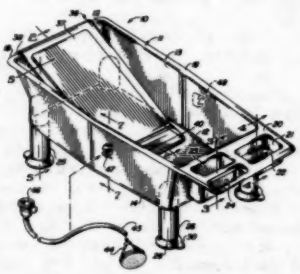
INFANT BATHTUB

Jacques E. Raphael, and Deirdre R. Raphael, both of 8251 Sanberry Blvd., Orlando, Fla. 32819

Filed Feb. 22, 1988, Ser. No. 158,551

Int. Cl.[5] A47K *3/024*

U.S. Cl. 4—572.1 **5 Claims**



1. A infant bathtub comprising:

a tub housing having an inside including a bottom and a plurality of walls upstanding from said bottom for holding bath water therein, said upstanding walls having an outwardly directed arcuate flange around their periphery, said tub housing having a spray hose snap attachment connected on an exterior thereof;

a plurality of legs removably attached to said tub housing for supporting said tub housing thereon, each of said plurality of legs having a suction cup mounted on the bottom thereof;

a plurality of article containers and at least one slot formed in said tub housing flange, and

a support surface removably located in said tub housing and having an arcuate surface on one end thereof for slipping over said arcuate flange in a mating fashion, an inclined surface extending from said arcuate surface to a flattened surface angled from said inclined surface for laying flat on the tub housing bottom a removable support surface attaching means having one of a hook and loop material placed on the bottom of the flattened end portion and another of a hook and loop material placed on the bottom surface of the tub said removable support surface also having a resilient foamed polymer material formed on the top thereof for supporting an infant thereon in a non-slip manner, whereby with said arcuate surface engaged over said arcuate flange said hook and loop material will cooperate to hold said support surface firmly locked onto said tub.

5,181,285

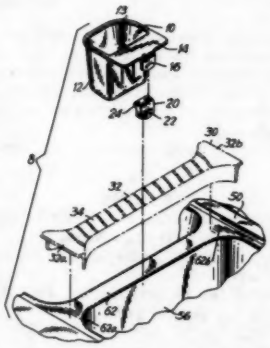
WEB PROTECTION SYSTEM FOR DOUBLE SINKS

Paul P. Kolada, Bexley, Ohio, assignor to American Standard Inc., New York, N.Y.

Filed Apr. 19, 1991, Ser. No. 687,653

Int. Cl.[5] A47L *17/00*

U.S. Cl. 4—657 **4 Claims**



1. A web protector for protecting the upper horizontal surface of a partition wall separating first and second sink basins, comprising a body molded from a plastic material, said body being essentially U-shaped in cross-section to define an essentially flat upper horizontal surface having two opposing legs depending downwardly therefrom, said legs each having opposing ends which are flared outwardly, said body being sized to be removably secured on said upper horizontal surface of said partition wall.

5,181,286

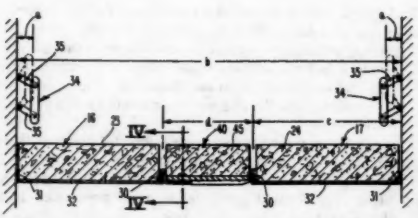
OPTIONAL BED ARRANGEMENT FOR SHIP STATEROOM USE

John F. McNulty, 473 S. Ithan Ave., Rosemont, Pa. 19010

Filed Dec. 26, 1991, Ser. No. 814,378

Int. Cl.[5] A47C *17/34*

U.S. Cl. 5—8 **14 Claims**



14. A process for optimizing shipboard bedding flexibility, comprising the steps of:

a) providing staterooms with a pair of narrow beds and at least one wall-mounted back support mounted on a stateroom wall above at least one of the pair of beds, to facili-

tate use of at least one bed as a seating facility when the convertible bed portion is removed relative to the pair of beds;

b) fixedly mounting the beds in the stateroom so that the beds are in spaced-apart, longitudinally parallel, generally congruent relation to each other with their long sides adjacent a stateroom wall, defining a longitudinal space there-between;

c) providing an optional center bed portion of a size to fit between the beds, in addition to the narrow beds and the at least one back support;

d) selectively and removably installing the center bed portion in the space between the beds, such that in the installed condition, the center bed portion and the two beds taken together define an upper bed surface in a generally common plane; and

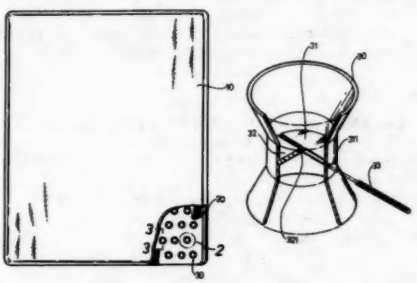
e) whereby a given stateroom may readily be converted between one providing spaced-apart separate smaller beds and one providing a single larger bed, for accommodating the needs of the user without requiring movement of any of the narrow beds or the at least one back support.

5,181,287

HEAT-VENTING INSULATING ARTICLE

Jun-Jie Yang, No. 65, Lane 566, Min-Shern South Road, Chia-Yi City, Taiwan

Filed Mar. 18, 1992, Ser. No. 853,617
Int. Cl.[5] A47C 9/02
U.S. Cl. 5—482 **1 Claim**



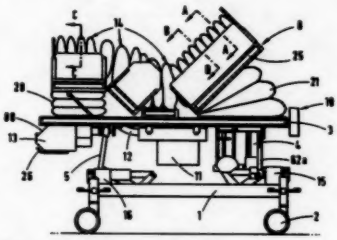
1. A heat-venting, insulating article including an intermediate heat-insulating layer provided with a plurality of through holes, and a heat-venting ring fitting in each of said through holes in said heat-insulating layer, each of said rings comprising an intermediate relatively small-sized portion between relatively large-sized end portions, said intermediate portion including a transverse separating layer comprising two semi-circular petals made of a soft flexible material and each including a diametrical edge, each of said petals being provided with a through pin hole in the diametrical edge thereof and said article further comprising a U-shaped metal pin having first and second legs inserted into respective through pin holes of said petals, each said metal pin being capable of expansion or contraction in response to a rise or fall in temperature, each said metal pin expanding to bend and push the two petals to both sides so as to form an opening between the two petals to let heat flow through when the metal pin is heated by body heat from a user of the article, and each said metal pin contracting to close the two petals when the metal pin cools off.

5,181,288

THERAPEUTIC TURNING BED

Keith P. Heaton; Kenneth W. Hunt, both of Dorset, and Rutland S. Boughton, Gloucestershire, all of England, assignors to The Mediscus Group Inc., Akron, Ohio

Continuation of Ser. No. 529,453, May 29, 1990, abandoned. This application Apr. 18, 1991, Ser. No. 687,080
Claims priority, application United Kingdom, May 30, 1989, 8912369; Dec. 22, 1989, 8929102
Int. Cl.[5] A61G 7/00
U.S. Cl. 5—607 **9 Claims**



1. A therapeutic bed which comprises:

(a) a trolley frame having floor-engaging feet or wheels,

(b) an attitude frame pivotably mounted on a trolley frame so as to be pivotable in a turning movement through a predetermined arc about an axis extending longitudinally of the bed,

(c) operating means for causing the attitude frame to pivot through said predetermined arc,

(d) a plurality of air sacs supported on said attitude frame and inflatable to a pressure sufficient to provide a resilient surface for supporting a patient thereon, said air sacs together forming a shaped cavity within which the patient's body can be nested and supported so that the patient does not slide off the bed during the turning movement of said attitude frame, each of said air sacs individually extending across at least a full horizontal section of the patient's body and individually forming a shaped cavity within which the horizontal section can be nested and supported both laterally and vertically, and

(e) control means for causing the turning movement in one direction of the attitude frame to be arrested in an inclined position when reaching the end of the predetermined movement in one direction and causing the operating means to reverse the direction of turning movement.

5,181,289

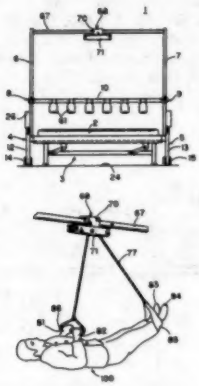
BED APPARATUS AND REHABILITATION ATTACHMENT

Kenzou Kassai, 14-9, Higashishinsaibashi 1-chome, Chuo-ku, Osaka, Japan

Filed Mar. 12, 1992, Ser. No. 849,727
Claims priority, application Japan, Mar. 15, 1991, 3-51738
Int. Cl.[5] A61G 7/00, 7/14
U.S. Cl. 5—612 **5 Claims**

1. A bed apparatus comprising: a bed body having a longitudinal dimension and a cross-directional dimension; a pair of sliders mounted on both end portions of said bed body for sliding along the cross direction of said bed body and extending in the cross direction of said bed body; a pair of upright bars mounted on said sliders to upwardly extend from said sliders; a pair of support members mounted for movement along said upright bars and stoppable at adjusted positions; a pair of parallel side bars coupling said pair of support members with each other; a rail coupling said pair of support members

with each other, said coupling rail being positioned above said pair of side bars; and a rehabilitation attachment movable along



said rail and comprising a pulley having an effective angle changeable about a vertical axis.

5,181,290

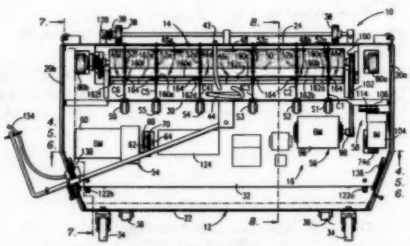
BOWLING LANE MAINTENANCE MACHINE

John M. Davis; Mark E. Davis, and David G. Jennings, all of Sebring, Fla., assignors to Kegel Company, Inc., Sebring, Fla.

Continuation of Ser. No. 713,725, Jun. 11, 1991. This application Jun. 5, 1992, Ser. No. 893,660

Int. Cl.[5] A47L *11/10*; A63D *5/10*

U.S. Cl. 15—98 **18 Claims**



1. In a bowling lane maintenance machine for applying a lane dressing to the surface of a bowling lane, the improvement comprising:

applicator means for receiving lane dressing from a source thereof and for applying lane dressing so received to the lane surface as the machine moves therealong; and

lane dressing delivery means comprising reservoir means and a plurality of wicks in fluidic communication with said reservoir means for receiving a lane dressing therefrom, said delivery means further including means for independently and selectively shifting each of said wicks between a first position in operative fludic communication with said applicator means and a second position out of operative fluidic communication with said applicator means to apply the lane dressing in a desired lane dressing profile.

5,181,291

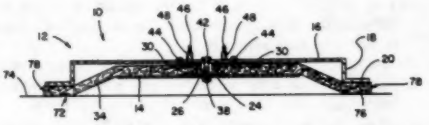
PAD SUPPORT ASSEMBLY FOR FLOOR POLISHING MACHINE

Daniel L. Fairheart, 1323 Begonia, O'Fallon, Mo. 63366

Filed Apr. 9, 1991, Ser. No. 682,662

Int. Cl.[5] A47L *11/14, 11/40*

U.S. Cl. 15—98 **21 Claims**



1. A pad support assembly for use with a circular floor buffing pad with the assembly and pad adapted to be rotated by a floor buffing machine for the pad to buff a floor, the assembly comprising:

a pad support member including a disk-like member having a central overhead portion, an annular peripheral portion downwardly spaced from the overhead portion for engaging the peripheral portion of the buffing pad, and wall means connecting the overhead and peripheral portions, the pad support member having a continuous uninterrupted construction so as to prevent air flow therethrough; and

a pad retaining plate including means for attaching the retaining plate to the underside of the overhead portion of the disk-like member with the pad positioned therebetween, the pad retaining plate being of continuous uninterrupted construction and covering a central portion of the pad to prevent air flow therethrough, the peripheral portion of the disk-like member engaging and pressing down on the peripheral portion of the pad during a buffing operation in a manner to prevent air flow between the peripheral portion of the disk-like member and the upper surface of the pad, and the peripheral portion of the disk-like member pressing down on the peripheral portion of the pad during a buffing operation to place the peripheral portion of the pad into contact with the floor.

5,181,292

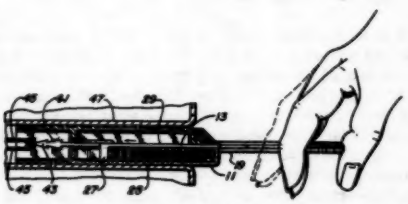
CLEANING CARTRIDGE FOR VIDEO GAMES AND COMPUTERS

Abraham Aghachi, 11724 Santa Monica Blvd., West Los Angeles, Calif. 90024

Filed Mar. 15, 1991, Ser. No. 670,076

Int. Cl.[5] B08B *11/00*; B24P *15/02*

U.S. Cl. 15—236.08 **22 Claims**



1. A device for cleaning opposed spaced electrical contacts within a computer or video game cartridge receptacle, said cleaning device comprising:

a manually manipulable housing adapted for slidable insertion into a cartridge receptacle, and

a blade slidably mounted in said housing for motion parallel to the direction of housing insertion, said blade having a leading edge portion with at least one face area adapted to clean electrical contacts within the cartridge receptacle,

said blade having a hand access opening for manual squeez-

ing action on an edge portion of said blade access opening to move the blade relative to the electrical contacts, whereby manual movement of the blade causes said at least one face area to scrape against and clean the electrical contacts to provide a cleaning action.

5,181,293

WIPER SYSTEM WITH EXTENDIBLE WIPER ARM

Peter Baumgarten, In der langen Gasse 13, 8630 Coburg; Bruno Egner-Walter, Käferflugstr. 43, 7100 Heilbronn; Eckhardt Schmid, Heilbronner Str. 62, 7129 Brackenheim, and Wolfgang Scholl, Forststr. 29, 7121 Gemmrigheim, all of Fed. Rep. of Germany

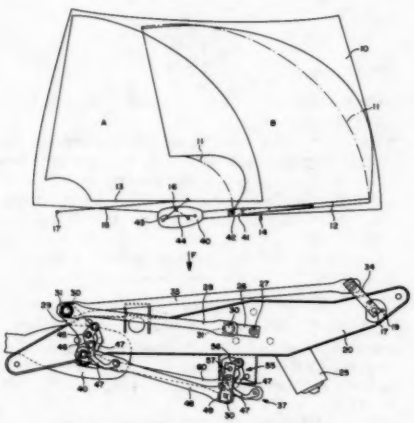
PCT No. PCT/EP89/00823, § 371 Date Mar. 26, 1990, § 102(e) Date Mar. 26, 1990

PCT Filed Jul. 15, 1989, Ser. No. 469,594

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1988, 3825321

Int. Cl.[5] B60S *1/36*

U.S. Cl. 15—250.21 **7 Claims**



1. A windshield wiper system comprising:

a wiper arm shaft;

a drive means coupled to said wiper arm shaft for imparting reciprocating movement to said wiper arm shaft between first and second reversing positions;

a wiper arm having a first section by which said wiper arm is mounted on said wiper arm shaft for pendulum-motion of said wiper arm as said wiper arm shaft undergoes reciprocating movement and a second section movable relative to said first section of said wiper arm along the longitudinal axis of said wiper arm;

a wiper blade attached to said second section of said wiper arm;

and mounting means for attaching said second section of said wiper arm to said first section of said wiper arm for pendulum-motion of said wiper blade with said wiper arm and movement of said wiper blade with said second section of said wiper arm along the longitudinal axis of said wiper arm during pendulum-motion of said wiper arm, said mounting means including:

(a) a stroking shaft coaxial with said wiper arm shaft and which moves in the same direction as movement of said wiper arm shaft from said first reversing position to said second reversing position and moves in the opposite direction as movement of said wiper arm shaft from said second reversing position to said first reversing position,

(b) means connected between said second section of said wiper arm and said stroking shaft for imparting movement to said second section of said wiper arm along the longitudinal axis of said wiper arm in response to movement of said stroking shaft,

(c) a stroking swivelling lever attached to said stroking shaft for pivotal movement of said stroking shaft with said stroking swivelling lever,

(d) a coupler connected at a first end to said stroking swivelling lever,

(e) an intermediate lever mounted for swivellable movement between first and second reversing positions and having a first end attached to a second end of said coupler and a second end coupled to said drive means,

said coupler passing through a dead center position while said immediate lever moves between said first and said second reversing positions of said intermediate lever at which dead center position longitudinal movement of said second section of said wiper arm is reversed.

5,181,294

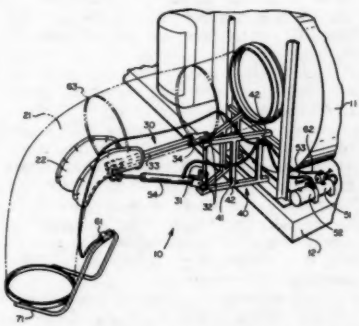
SUPPORT AND MANIPULATION MECHANISM FOR LEAF AND DEBRIS COLLECTOR

Richard J. Campbell, 7059 Erie St.; George G. Miller, 10030 Sylvania-Metamora Rd., and Steven P. Venia, 4935 Arbor Way, all of, Sylvania, Ohio 43560

Filed Jul. 19, 1991, Ser. No. 732,901

Int. Cl.[5] A47L *5/36*

U.S. Cl. 15—315 **4 Claims**



1. In a machine used for collecting leaves and debris, a mechanism for the support and manipulation of an intake hose, comprising:

a fixed support frame, said support frame having horizontal support members being mounted on a chassis of a leaf and debris collector and providing a fixed vertical bearing surface including a pivot shaft;

a swing arm, said swing arm extending horizontally from said support frame, said swing arm comprising an upper swing arm member pivoting about a horizontal axis keyed to a vertical pivot bracket, said upper swing arm member being fixed at one end to the upper pivot point of said pivot shaft and being at the other end fixed to an intake hose cradle;

means for pivoting said swing arm, said pivoting means comprising said pivot shaft having a bearing at both the upper and lower ends, said pivot shaft pivotally linking said swing arm with said support frame;

an intake hose cradle, said intake hose cradle fixed to the outermost end of said swing arm, said intake hose cradle used to support an intake hose from underneath; and

means for manipulating such intake hose, said hose manipulation means being for controlling the movement of said intake hose in both the horizontal and vertical planes.

5,181,295

METHOD OF CONTROLLING MACHINES FOR CLEANING OF FIBERS

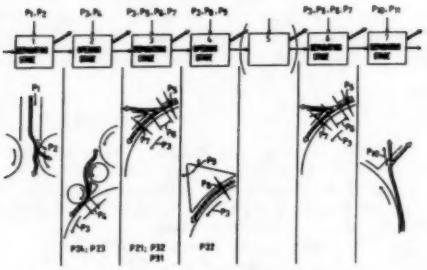
Robert Demuth, Nurensdorf, and Jurg Faas, Dinhard, both of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland

Filed Mar. 22, 1991, Ser. No. 673,418

Claims priority, application Switzerland, Mar. 22, 1990, 957/90

Int. Cl.[5] D01G *9/00*

U.S. Cl. 19—65 A **15 Claims**



1. In a fiber cleaning method comprising the steps of:

allocating machine setting values of a machine or machine group of different machines for cleaning fibers, into a first machine operating function representative of the intensity of cleaning of the fibers and a second machine operating function representative of the quantity of fiber waste;

said machine setting values being representative of predetermined variations of setting possibilities of setting elements of the machine or machine group;

forming a parameter field representing a region of useful fiber treatment results derived from a respective table whose contents have been empirically determined for the intensity of cleaning of the fibers and for the quantity of fiber waste, respectively, said parameter field establishing an applicable useful range of the setting possibilities of the setting elements of the machine or the machine group with regard to the intensity of cleaning of the fibers and the quantity of fiber waste;

selecting a working point within the parameter field, upon operation of the machine or the machine group, to derive control signals for setting of the setting elements with regard to the intensity of cleaning of the fibers and the quantity of the fiber waste;

employing the derived control signals for setting the setting elements with regard to the intensity of cleaning of the fibers and the quantity of the fiber waste; and

operating the machine or the machine group with such setting of the setting elements, in order to control the machine or the machine group of different machines for cleaning of the fibers.

5,181,296

REINFORCED CARRIER DISC FOR OPERABLE PARTITION SYSTEM

Charles E. Williams, Delavan, Wis., assignor to Hufcor, Inc., Janesville, Wis.

Filed Dec. 31, 1991, Ser. No. 815,380

Int. Cl.[5] E05D *13/02*; A47H *15/00*

U.S. Cl. 16—95 R **15 Claims**

1. A multidirectional carrier and track comprising, in combination,

a track,

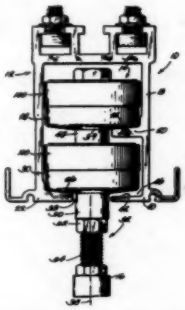
means on said track defining a disc supporting surface,

a disc,

means defining an axis and supporting said disc for rotation about said axis and with said disc in engagement with said disc supporting surface,

said disc including first and second bearing assemblies, said bearing assemblies having inner and outer races, said inner races mounted adjacent one another along said axis,

an outer cylindrical rim portion, said rim portion having an inner-facing surface, an outer-facing surface and upper and lower surfaces, said inner-facing surface engaging said outer races and said lower surface contacting said track, and



means on said inner-facing surface defining spaced faces projecting radially inward towards said axis in step-wise fashion, forming two axially spaced, radially extending shoulders projecting from said inner-facing surface,

said outer races in contact with said shoulders and thereby held in said outer rim portion against axial movement in one direction relative to the axis of said support member.

5,181,297

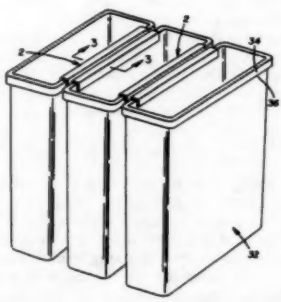
CONNECTOR CLIP FOR WASTE RECEPTACLES

Howard W. Andrews, Jr., Winchester; John A. Kowalski, Stephens City, and Friedrich G. Wahl, Boyce, all of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Jun. 10, 1991, Ser. No. 712,456

Int. Cl.[5] B65D *21/02*

U.S. Cl. 24—336 **5 Claims**



1. A connector clip for adjoining waste receptacles or the like, comprising:

an elongate clip body of substantially M-shape in cross-section said body comprising spaced apart attachment portions adapted to attach over upper rims of first and second receptacles and affix thereto, whereby positioning said receptacles in side by side relationship;

said body further comprising an intermediate connective portion connecting bottom portions of opposed outward

legs of said attachment portions and separating said opposed outward legs a prescribed distance, whereby maintaining said receptacles in a spaced apart relationship;

said connective portion being composed of resilient material, wherein said clip flexibly absorbing stress as one of the waste receptacles is moved relative to the other, whereby inhibiting unintentional separation of said clip from said waste receptacles, and said connective portion having a downwardly concave bottom surface and defining with said opposed outward legs a top-opening longitudinal channel adapted to receive a top edge of a refuse bag positioned in either, or both, of the receptacles; and

said connection portion bottom surface extending outwardly beyond said outward legs of said attachment portions, and said connective portion further comprising inwardly directed horizontal portions connecting opposite upper ends of said bottom concave surface with bottom ends of said outward legs of said attachment portions.

5,181,298

PULL TAB FOR SLIDE FASTENER SLIDERS

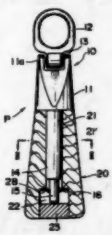
Yoshiyuki Horita, Toyama; Susumu Ishii, and Toshiaki Takizawa, both of, Kurobe, all of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Feb. 13, 1991, Ser. No. 654,512

Claims priority, application Japan, Feb. 14, 1990, 2-13376[U]

Int. Cl.[5] A44B *19/26*

U.S. Cl. 24—429 **22 Claims**



1. A pull tab to be pivotally joined with a slider body of a slider fastener for manipulating the slider, the pull tab comprising:

a substantially frustoconical link portion having a first end pivotally connected with the slider body, and a second end adapted for connection to a pull tab body;

a pull tab body having an end portion having a cross-sectional shape substantially identical with a cross-sectional shape of said second end of the link portion; and

means for connecting said second end of the link portion and the end portion of the pull tab body,

the connecting means comprising a through hole formed axially through the pull tab body, the through hole having a small-diametered hole portion extending from the end portion of the pull tab body and a large-diametered hole portion communicating with the small-diametered hole portion via a circumferential step and being open at a second end portion of the pull tab body; a support shaft axially extending from the second end of the link portion and inserted through the small-diametered hole portion, and means provided in the large-diametered hole portion for fastening a distal end of the support shaft to the circumferential step.

5,181,299

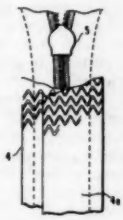
ZIPPER HAVING ANTI-JAM FLAPS

Hung C. Huang, 4340 E. Florence Ave., Bell, Calif. 90201

Filed Dec. 10, 1991, Ser. No. 804,378

Int. Cl.[5] A44B *19/00*

U.S. Cl. 24—432 **5 Claims**



1. A zipper of the type including two rows of teeth, and a catch for joining/unjoining the two rows of teeth as the catch is moved relative to the two rows of teeth, the improvement comprising:

a pair of flaps disposed underneath said two rows of teeth, respectively, said flaps being attached to the zipper such that as the catch moves relative to the two rows of teeth to join the two rows of teeth together, said pair of flaps overlap each other, each of said pair of flaps having a width which extends beyond a width of said two rows of teeth such that when said pair of flaps overlap each other, each of said flaps covers and extends beyond a center of said two rows of teeth thereby preventing extraneous material from being entangled in the catch and the two rows of teeth.

5,181,300

WAISTBAND FASTENER

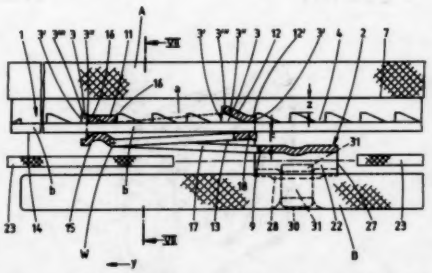
Michael Schwarz, Herne, Fed. Rep. of Germany, assignor to Schaeffer GmbH, Wuppertal, Fed. Rep. of Germany

Filed Nov. 4, 1991, Ser. No. 787,572

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1990, 4035933; Mar. 8, 1991, 4107435

Int. Cl.[5] A44B *19/00*

U.S. Cl. 24—585 **48 Claims**



1. A waistband fastener, especially for trousers, skirts or the like having first and second waistband portions arranged to overlie one another with said first waistband portion closer to the body of the wearer than said second waistband portion, which waistband fastener includes a latch rail fixed to said first waistband portion, a slider connected to said second waistband portion and guided on said latch rail for reciprocal movement therealong, said latch rail on a face thereof directed toward said first waistband portion being provided with a plurality of teeth of a sawtooth-like configuration spaced from each other

by respective gaps bounded each by a steep flank of one tooth and a sloping flank of the next adjacent tooth, and a latch finger carried by said slider and adapted to enter into said gaps between the teeth of the latch rail; wherein the improvement comprises that:

(a) said latch rail has (i) a pair of lateral portions disposed at a distance from said first waistband portion, and (ii) a central upstanding foot extending longitudinally of said latch rail between said lateral portions and being in contact with and secured to said first waistband portion;

(b) said lateral portions on the faces thereof directed toward said first waistband portion are provided with respective sets of said sawtooth-like teeth;

(c) said slider has at its opposite side regions respective U-shaped legs open inwardly of, and overlapping the proximate outer border regions of, said lateral portions of said latch rail for guiding said slider along said latch rail, and further has respective latch fingers adapted to coact with and enter into the gaps between said teeth of the respective sets of teeth;

(d) said slider is arranged for transverse shifting jointly with said latch fingers relative to said latch rail toward and away from said first waistband portion for selectively positioning said latch fingers out of and in contact with said teeth as well as out of and in said gaps therebetween; and

(e) said latch fingers are constructed and arranged to ride along and over said teeth in contact therewith and hence into and out of said gaps when said slider, while transversely shifted away from said first waistband portion, is moved lengthwise of said latch rail in the direction toward said sloping flanks of said teeth, and (ii) to be brought out of contact with said teeth and hence fully out of said gaps and clear of the tops and said steep flanks of said teeth so as to move freely past the latter when said slider, while transversely shifted toward said first waistband portion, is moved lengthwise of said latch rail in the direction toward said steep flanks of said teeth.

5,181,301

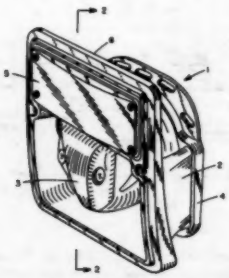
METHOD OF MAKING A VERY COMPACT AUDIO WARNING SYSTEM

Basil W. Wheeler, Rte. 9, Box 209, Athens, Ala. 35611

Continuation of Ser. No. 446,126, Dec. 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 142,915, Jan. 12, 1988, Pat. No. 4,884,523, which is a continuation-in-part of Ser. No. 837,011, Mar. 6, 1986, Pat. No. 4,178,372. This application Sep. 20, 1991, Ser. No. 762,798

Int. Cl.[5] B29D *17/00*

U.S. Cl. 29—169.5 **5 Claims**



1. A method of making a very compact voiceless vehicular warning system including a light and a sound generator disposed for emitting voiceless warning sound waves to the atmosphere, said sound generator having an outlet, a sound deflector means, and an expander horn for expanding and propagating sound waves generated by said sound generator, said method comprising the steps of:

forming a housing with a cavity defining said expander horn, said expander horn having side enclosures, a closed rear enclosure and an open front portion;

forming said housing with a wall having an upper vertical portion provided with an opening therein, an intermediate horizontal portion, and a lower portion, said upper vertical portion and said intermediate portion forming a semi-circular receptacle for support of said sound generator, and, said intermediate portion and said lower portion forming a said side enclosure and said rear enclosure for said expander horn;

mounting said sound generator in said semi-circular receptacle for aligned relation of said sound generator outlet with said opening;

attaching said sound deflector to said vertical portion of said wall, said sound deflector disposed for receiving the sound waves from said sound generator outlet and for deflecting said sound waves through a first angle of substantially 90° and then through a second angle of substantially 90° for subsequent propagation of the sound waves substantially 180° from the path formed by the second deflection of the voiceless warning sound waves, whereby said propagated sound waves serve as a voiceless audio warning signal;

forming a receptacle in side-by-side relation with said expander horn and mounting said light in said receptacle; and

attaching said voiceless audio warning system to a vehicle whereby a vehicular warning system is produced.

5,181,302

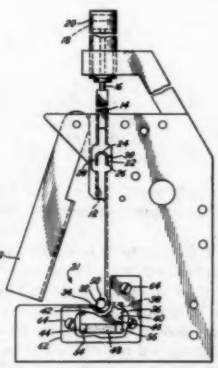
DIE CONSTRUCTION FOR CLIPPER MECHANISM

Alfred J. Evans, Raleigh, N.C., assignor to Delaware Capital Formation, Inc., Apex, N.C.

Continuation of Ser. No. 418,983, Oct. 6, 1989, abandoned, which is a continuation of Ser. No. 258,799, Oct. 17, 1988, abandoned. This application Aug. 7, 1990, Ser. No. 564,137

Int. Cl.[5] B23P *11/00*

U.S. Cl. 29—243.56 **6 Claims**



1. An improvement in a clip attachment mechanism, the clip attachment mechanism for attaching U-shaped metal clips about gathered casing material, at spaced intervals, to thereby form ends of stuffed products, the stuffed products containing comminuted materials, the metal clips having crowns and depending legs, the mechanism attaching the metal clips in the manner described by forming the legs of the U-shaped clips to encircle the gathered material, the mechanism including a C-shaped die support plate with a channel for receipt of a clip and a die support at a distal end of said channel for holding a die, the die defining a spiral groove for receipt of the legs of the clip, the die directing the deformation of the legs of the clip along the spiral groove to form the legs of the clip about the

gathered material, the mechanism further including a punch slidable in the channel for engaging the crown of the clip to drive the clip against the die, and means for operating the punch to reciprocate in the channel, the improvement comprising, in combination with the clip attachment mechanism as described:

elastic die block support means for supporting and maintaining said die block in a relatively fixed position at said distal end of said channel, said die block support means progressively responsive to increased pressure on said die block to allow increased displacement of said die block in the direction of said punch moving toward said die block.

5,181,303

DISLODGEMENT DEVICE

John Gregg, 2475 Cerritos Ave., Signal Hill, Calif. 90806

Filed Dec. 18, 1991, Ser. No. 809,900

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—255 **19 Claims**

1. A dislodgement device, comprising:

a handle formed to be held by one hand of a user;

a grip formed to be held by the other hand of a user and defining at least one opening, said handle being disposed on one side of said grip;

a weight member on the opposite side of said grip;

weight member support means slidably disposed through said at least one opening in the grip, connecting the weight member to the handle whereby to enable the handle to draw the weight member against the grip;

an impactor; and

impactor support means slidably disposed through the weight member, connecting the impactor to the grip whereby drawing of the weight member against the grip transmits a hammering force to the impactor.

5,181,304

ADJUSTABLE ALIGNMENT ASSEMBLY AND METHOD

Tadeusz W. Piotrowski, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Jul. 16, 1991, Ser. No. 730,548

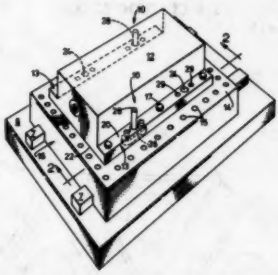
Int. Cl.[5] B25B *27/14*

U.S. Cl. 29—271 **10 Claims**

1. An adjustable assembly for aligning a machine tool module on a module mounting surface of a machine base having at least one pin alignment bore with a central axis substantially normal to the module mounting surface, said assembly comprising:

an attachment portion of said machine tool module, said attachment portion having a module attachment face received against said module mounting surface, said attachment portion also having a plate mounting surface substantially parallel with said module mounting surface;

an alignment plate adjustably secured to said attachment portion, said alignment plate having a plate face retained against said plate mounting surface in use, and a precision bore extending therethrough along a central axis substantially normal to said plate face; and



anchoring means for loosely securing said alignment plate to said attachment portion for adjustment relative thereto, and for tightly securing said alignment plate thereto once said precision bore is properly aligned with said pin alignment bore.

5,181,305

PROCESS FOR THE MANUFACTURE OF SLIDE FASTENERS

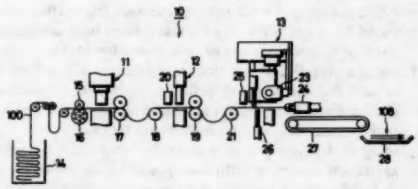
Masahide Ozaki, Kurobe; Masanori Uji, Osaka; Makoto Yamazaki, and Tatsuo Ito, both of Kurobe, all of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 5, 1991, Ser. No. 710,546

Claims priority, application Japan, Jun. 6, 1990, 2-147635

Int. Cl.[5] B21D *53/50*; A41H *37/06*

U.S. Cl. 29—408 **3 Claims**



1. In the manufacture of slide fasteners from an elongate stringer chain in which said stringer chain is gapped at predetermined intervals, applied with slider fastener component parts such as a bottom end stop, a slider and top end stops and cut into individual slide fastener products, the process which comprises maintaining said stringer chain in substantially tensionless suspension by allowing it to say by its own weight at predetermined locations along the path of its movement through a plurality of processing stages and effecting the operation of said processing stages in synchronism with a selected one of said stages which has a slowest cycle of operation.

5,181,306

METHOD OF MAKING LASER GYRO RESONATOR BLOCKS

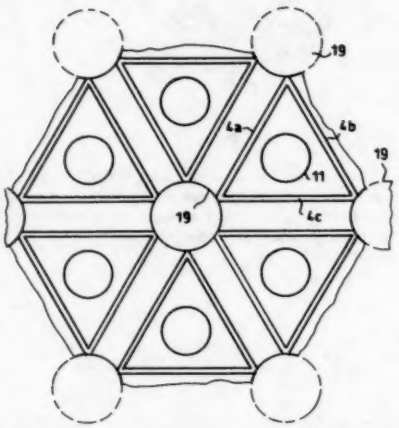
Arnold Güttner, Königsbronn; Jobst Herrmann, Aalen, and Karl-H. Simon, Stuttgart, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Feb. 6, 1992, Ser. No. 831,891

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1991, 4103789

Int. Cl.[5] B23P *17/00*

U.S. Cl. 29—413 17 Claims



1. A method of making a plurality of laser gyro resonator blocks wherein each resonator block defines a closed loop path in which two laser beams rotate in mutually opposite directions for measuring angular velocities, each of the resonator blocks including two component parts sandwich joined to each other to define a resonator block with the closed loop path being defined by a plurality of tunnel segments interconnected to form an outline having a plurality of corners with respective resonator mirrors mounted at the corners, the method comprising the steps of:

providing a first plate having a first flat surface subdivided by a plurality of imaginary lines into said first parts of respective ones of said resonator blocks;

providing a second plate having a second flat surface subdivided by a plurality of imaginary lines into said second parts of respective ones of said resonator blocks;

forming a plurality of interconnected channels in at least one of said flat surfaces for defining a plurality of interconnected channel segments arranged along the closed loop paths of corresponding ones of said blocks;

placing said plates one atop the other to form a composite sandwich structure with said plates being joined at said flat surfaces in a vacuum-tight manner with said other flat surface and said interconnected channel segments of each of said closed loop paths forming said plurality of tunnel segments interconnected to define said closed loop paths for corresponding ones of said resonator blocks;

then separating said composite sandwich structure along said imaginary lines to form the plurality of resonator blocks; and,

forming mounting surfaces at the corners of each of said blocks for mounting said resonator mirrors on respective ones of said mounting surfaces for reflecting said beams between mutually adjacent tunnel segments.

5,181,307

METHOD AND APPARATUS FOR ASSEMBLING DOOR FOR MOTORCAR

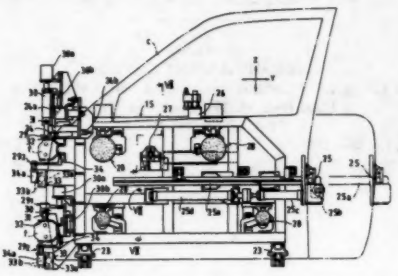
Michihiro Kitahama, and Akira Miyazaki, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1991, Ser. No. 646,037

Claims priority, application Japan, Feb. 15, 1990, 2-34740

Int. Cl.[5] B23P *11/00*

U.S. Cl. 29—434 4 Claims



1. A method of assembling a door for a motorcar comprising the steps of:

aligning said door to a motorcar body;

removing looseness at a hinge portion of a hinge bracket which is hingedly provided on said door, said looseness being in a direction in which a door load is applied, wherein the step of removing looseness includes the step of moving or bracing at least one of a first end of a side portion of the said hinge bracket and a second end of a side portion of said hinge bracket, said first end having a position nearer to said hinge portion than a position of said second end; and

fastening said hinge bracket to said motor car body.

5,181,308

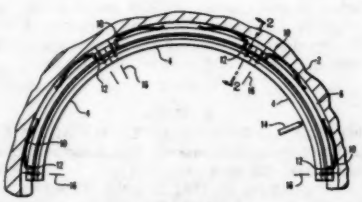
METHOD FOR INSTALLING ANNULAR SEALS

Lewis Gray, Winter Springs, Fla.; Joseph L. Garbarino, Voorhees, N.J.; John S. Micol, Durham, N.C.; Johnny W. Crenshaw, Lancaster, S.C.; Vincent M. Iacono, Wilmington, Del.; James C. Barley, Charlotte, N.C.; Richard L. Hollen, Bellwood, and Terry M. Graziani, Ellwood City, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 22, 1991, Ser. No. 733,523

Int. Cl.[5] B23P *11/00*

U.S. Cl. 29—436 10 Claims



1. A method of installing a seal having a cylindrical sealing surface in a defined operating position in a rotating machine composed of a stationary part which carries the seal and a rotary part mounted to rotate about an axis of rotation and having a cylindrical surface located to rotate adjacent, and in close proximity, to the sealing surface, said method comprising: installing the seal on the stationary part in a position corresponding to the defined operating position so that the seal is immovable relative to the stationary part and machining the

sealing surface to a final dimension corresponding to the cylindrical surface of the rotary part by mounting a machine tool to rotate about the axis of rotation and rotating the tool about that axis; withdrawing the tool; and modifying the installation of the seal so that the seal is supported in the defined operating position so as to be resiliently movable relative to the stationary part.

5,181,309

STAPLING UNIT HAVING AN AUXILIARY DEVICE FOR ATTACHING AN ANVIL

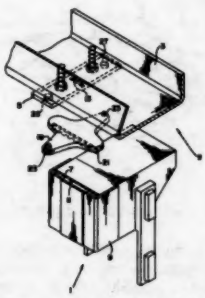
Manfred Radtke, Korb, Fed. Rep. of Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 25, 1991, Ser. No. 796,967

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1991, 9102798[U]

Int. Cl.[5] B23Q *3/18*; B25C *7/00*

U.S. Cl. 29—465 **6 Claims**



1. A stapling unit in combination with a mechanism for aligning, at a stapling position, an anvil of said stapling unit with a movable stapling head of said stapling unit, moved to said stapling position, comprising:

(a) a staples ejection opening in the stapling head for ejecting staples driven by the stapling head;

(b) first and second alignment bores spaced apart a first distance in said anvil;

(c) arcuate recess means formed in the anvil between said first and second bores for receiving and bending legs of a driven staple; and

(d) said mechanism comprising a plate member having first and second sides, said plate member including:

(i) first and second pins spaced apart substantially said first distance on said first side of said plate member for insertion into said first and second alignment bores in said anvil; and

(ii) a rib-shaped projection formed on said second side of said plate member for insertion into said staples ejection opening in said stapling head.

6. A method for fixedly mounting an anvil of a stapling unit, having a staple legs bending recess, at a stapling position with a movable stapling head of the stapling unit having an operative position at said stapling position and a non-operative position remote from said stapling position, the method comprising the steps of:

(a) moving the stapling head to the non-operative position;

(b) providing an anvil with a first alignment bore in said anvil to a first side of said staple legs bending recess and a second alignment bore to a second and substantially opposite side of said recess;

(c) providing a plate member having first and second pins on a first surface thereof adapted for inserting respectively into said first and second alignment bores in said anvil, and having a rib-shaped projection on the second surface thereof;

(d) loosely mounting said anvil to a base member at said stapling position;

(e) attaching said plate member to the stapling head by inserting said rib-shaped projection of said plate member into an opening in the stapling head for ejecting staples;

(f) moving the stapling head to the operative position;

(g) adjustably moving said loosely mounted anvil into an aligned position for inserting said first and second pins of said plate member into said first and second alignment bores in said anvil; and

(h) fixedly mounting said anvil in said aligned position.

5,181,310

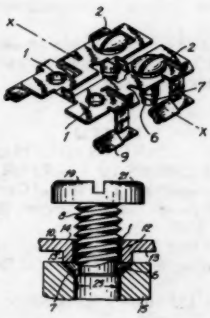
METHOD OF MAKING A THREADED INSERT ASSEMBLY

Arnold Josephson, Greenlawn, N.Y., assignor to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Continuation of Ser. No. 683,404, Apr. 10, 1991, abandoned, which is a continuation of Ser. No. 542,865, May 23, 1990, abandoned. This application Feb. 24, 1992, Ser. No. 841,235

Int. Cl.[5] B21D *39/00*

U.S. Cl. 29—517 **5 Claims**



1. A method of making a threaded insert assembly, which comprises:

forming an unthreaded through-hole into deformable material,

inserting a threaded insert that is a single unitary element including a head on one end, a tip at the other and threads which stop short of the tip, the tip having a diameter which is larger than the threads' minor diameter, and approximately equal to but less than the threads' major diameter, into said unthreaded through-hole in said deformable material so that,

a) the major diameter of the insert's threads and the inner diameter of the hole are closely received,

b) the insert's threads,

upsetting the material adjacent to the exit region of the hole so that said material moves into the threads located within the exit region of the hole for holding the insert by those threads wherein said insert in adjustable by rotating and restrained from withdrawal by the diameter of its tip.

5,181,311

METHOD FOR MANUFACTURING AN AMORPHOUS METAL CORE FOR A TRANSFORMER THAT INCLUDES STEPS FOR REDUCING CORE LOSS

Albert C. Lee, Hickory, N.C., assignor to General Electric Company, Hickory, N.C.

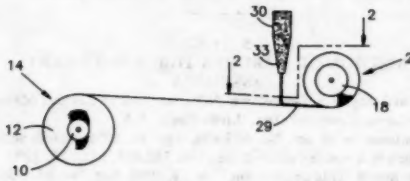
Filed Oct. 9, 1991, Ser. No. 773,405

Int. Cl.[5] H01F *3/04, 41/02*

U.S. Cl. 29—609 **8 Claims**

1. A method of making a transformer core from amorphous metal strip material wrapped about the window of the core, comprising the following steps:

(a) providing amorphous metal strip material having essentially no insulating coating applied and bonded thereto,
(b) wrapping said strip material onto an arbor in superposed layers, thereby forming a multi-layered core form,
(c) applying one or more coats of powder to said strip material before the strip material is wrapped onto the arbor, thereby causing predetermined adjacent ones of said layers to be separated by small distances to control the space factor of said core form,



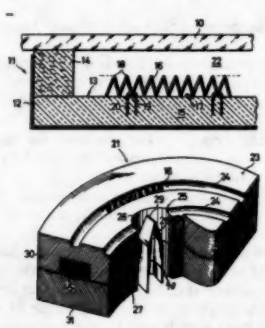
(d) annealing said core form while said one or more powder coats are present between adjacent layers, thus enabling said powder to lessen the tendency of adhesions to develop between adjacent layers of amorphous metal during annealing, and
(e) maintaining said powder coatings substantially unbonded with respect to the underlying amorphous metal strip material during annealing.

5,181,312

METHOD AND APPARATUS FOR FIXING HEATING RESISTORS TO A SUPPORT

Martin Gross, Kaempfelbach, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed May 31, 1991, Ser. No. 708,187
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1990, 4019898.7
Int. Cl.[5] H05B *3/00*; B23P *19/00*
U.S. Cl. 29—611 **18 Claims**



1. Method for fixing at least one heating resistor to a support, made from heat resistant insulating material, by means of clips driven in to the support by means of a mechanical clip fitting device comprising the steps of:
detachably fitting the heating resistor to the heating resistor guidance means of an attaching tool in a desired configuration,
positioning the heating resistor together with the attaching tool relative to a surface of the support,
fitting the clips to the support and then
removing the attaching tool from the support, the heating resistor also being removed from the attaching tool.

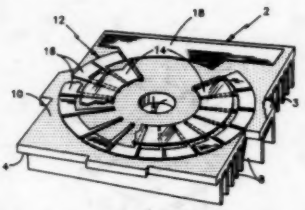
13. Apparatus for fixing at least one heating resistor to a support made from heat resistant insulating material by means of clips driven into the support by a mechanical clip fitting device, comprising an attaching tool for positioning the clip relative to the heating resistor, the attaching tool having heating resistor guidance means in the form of grooves for the detachable fitting of the heating resistor in its desired configuration to said tool.

5,181,313

METHOD OF MAKING A VARIABLE POWER RESISTOR

Ronald C. Nonnenmacher, Apache Junction, Ariz.; Kathleen Schulz, Novi, Mich.; Richard C. Lewis, Merrimack, N.H., and Richard Riley, Riverside, Calif., assignors to United Technologies Automotive, Dearborn, Mich.

Division of Ser. No. 629,885, Dec. 19, 1990, Pat. No. 5,119,063. This application Jan. 9, 1992, Ser. No. 818,597
Int. Cl.[5] H01C *17/06, 17/28*
U.S. Cl. 29—620 **6 Claims**



1. A method of making a variable power resistor, comprising:
(a) plasma spraying an electrically insulating, thermally conductive ceramic coating on a front face of a heat sink;
(b) screen printing a plurality of discrete thick film conductive circuit pads onto the electrically insulating, thermally conductive ceramic coating, wherein the conductive circuit pads comprise about 10 wt. % to about 70 Wt. % of a lead borosilicate glass matrix, about 15 wt. % to about 20 wt. % zirconium spinel reinforcing particles, and up to about 90 wt. % coprecipitated palladium and silver conductive particles in an amount effective to provide a resistance of up to about 0.5 ohms/square;
(c) screen printing a thick film resistive layer over portions of the conductive circuit pads such that the circuit pads are electrically connected in series through the thick film resistive layer, wherein the resistive layer comprises about 5 wt. % to about 70 wt. % of a lead borosilicate glass matrix, about 15 wt. % to about 20 wt. % zirconium spinel reinforcing particles, and more than about 5 wt. % coprecipitated palladium and silver conductive particles in an amount effective to provide a resistance of greater than 0.5 ohms/square; and
(d) installing a moveable contactor capable of contacting the circuit pads in order to vary the resistance of the resistor.

5,181,314

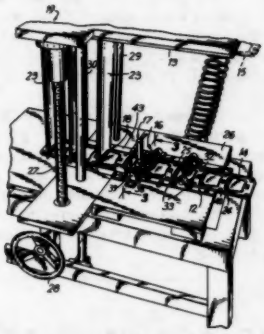
APPARATUS FOR MANUFACTURING AIR TURNING ASSEMBLY

John E. Lyons, Levitown, and Joseph Magrane, Farmingdale, both of N.Y., assignors to Duro Dyne Corporation, Farmingdale, N.Y.

Division of Ser. No. 692,990, Apr. 29, 1991. This application Apr. 29, 1992, Ser. No. 875,306
Int. Cl.[5] B23P *19/00, 11/00*
U.S. Cl. 29—796 **4 Claims**

1. Apparatus for fabricating an air turning assembly formed of a spaced parallel pair of vane rails and a plurality of vanes, said rails including projections deflected from the planes thereof, said projections including slots directly substantially transversely to the longitudinal axis of said rails, said vanes being arcuate sheet metal blanks, said apparatus comprising

guide means for supporting a pair of said rails in parallel spaced relation with respective projections on each said rail facing each other, feed means for synchronously advancing said rails to a staking station with respective slots of each of said rails aligned with each other, yieldable support means at said station for enabling the spacing of said rails to be increased to permit



insertion in said slots of end portions of a vane member and staking means at said station for simultaneously distorting said end portions of said vanes, said staking means including opposed vane deflection portions mounted for coaxial movement toward and away from each other between staking and inactive positions respectively.

5,181,315

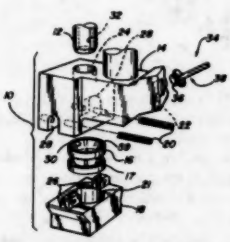
FASTENER INSTALLATION APPARATUS

Dale H. Goodsmith, Brighton, Mich., assignor to Multifastener Corporation, Detroit, Mich.

Continuation of Ser. No. 486,482, Feb. 28, 1990, abandoned. This application Jul. 3, 1991, Ser. No. 727,325

Int. Cl.[5] B23P *19/00*

U.S. Cl. 29—798 **21 Claims**



1. An installation apparatus for installing fastening elements on a workpiece, said fastening elements each having a radially extending flange portion connected to a generally cylindrical head portion, said installation apparatus including a plunger passage, a plunger reciprocating through said plunger passage and a feed passage communicating with said plunger passage, said plunger passage adapted to receive said fastening elements beneath said plunger for installation on said workpiece by said plunger, the improvement comprising:

a fastening element holder formed from an elastic material, said holder located in said plunger passage and having an axial passage therethrough, said holder axial passage coaxially aligned with said plunger, said holder axial passage including an entrance opening proximate said plunger and an exit ope..ing distal said plunger, and wherein said holder axial passage is further defined by means for coaxially aligning said fastener with said holder axial passage without influence from said plunger, said aligning means including a first and second surface, said first surface sloping radially inwardly and downwardly, said second surface being generally cylindrical and extending generally downwardly, said first surface extending between said entrance opening and said second surface, and wherein said axial passage formed by said generally cylindrical second surface has a dimension sufficiently large so as to allow said head portion of said fastening element to freely enter therein while opposing the free passage of said flange portion of said fastening element,

whereby said first surface is adapted to receive said head portion of said fastener and said slope of said first surface is adapted to center said fastener head portion within said holder axial passage defined by said generally cylindrical surface, whereby said fastener head is adapted to freely drop therein in alignment with said plunger, and said elastic holder is adapted to resiliently spread radially to permit passage of said fastening element through said axial passage upon engagement of said plunger against said fastening element, said plunger being effective for driving said fastening element through said holder passage and into engagement with said workpiece.

5,181,316

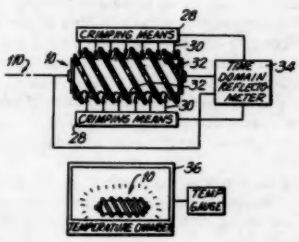
METHOD FOR MAKING FLEXIBLE COAXIAL CABLE

William Pote, Glen Gardner; Roger Johansen, South Plainfield, and Thomas Pote, Gladstone, all of N.J., assignors to Flexco Microwave, Inc., Port Murray, N.Y.

Filed Aug. 23, 1991, Ser. No. 749,194

Int. Cl.[5] H01B *13/10*

U.S. Cl. 29—828 **17 Claims**



1. In a method of making a flexible coaxial cable comprising the steps of providing a core for said cable, said core comprising an inner conductive member and dielectric means surrounding said inner conductive member, said inner conductive member being located substantially along the longitudinal axis of said dielectric means, said dielectric means having an outermost radial extent about said longitudinal axis; and providing a flexible hollow outer conductive sheath of substantially the same extent as said core, said sheath having a longitudinal axis coextensive with said core longitudinal axis and an innermost radial extent about said longitudinal axis which defines the innermost circumference of said hollow within said sheath, said sheath innermost radial extent being initially larger than said core outermost radial extent, said sheath comprising a corrugated portion having a plurality of peaks and valleys of predetermined pitch with a conductive portion disposed about said peaks, said valleys defining said sheath innermost radial extent, said peak conductive portion defining the sheath outermost radial extent; the improvement comprising the steps of inserting said core within said sheath until said sheath and said core are substantially coextensive; and substantially simultaneously crimping solely said valleys of said outer conductive sheath corrugated portion from at least three angularly spaced directions about said outer conductive sheath longitudinal axis by using angularly spaced crimping wheels which float to follow said predetermined pitch of said outer conductive sheath corrugated portion for embedding said valleys of said

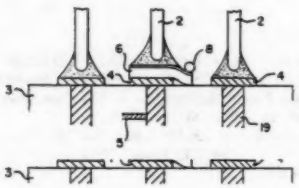
outer conductive sheath corrugated portion in said dielectric means so as to lock said dielectric means to said outer conductive sheath, said sheath innermost radial extent defined by said valleys after said crimping being less than said core outermost radial extent; whereby uniform crimping of said outer conductive sheath is provided for providing electrical stability for said flexible coaxial cable.

5,181,317

METHOD OF MAKING AN ENGINEERING CHANGE TO A PRINTED WIRING BOARD

Mikio Nishihara, Tokyo, Japan; Teruo Murase, San Jose, Calif.; Kiyotaka Seyama, Kawasaki; Kiyoshi Kuwabara, Sagamihara, and Osamu Ohshima, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 27, 1991, Ser. No. 766,244
Claims priority, application Japan, Sep. 28, 1990, 2-257524
Int. Cl.[5] H05K *3/34*
U.S. Cl. 29—401.1 **8 Claims**



1. A method of making an engineering change to a printed wiring board to change a connection for a terminal of an electronic component, which is mounted on the printed wiring board, through a terminal pad, the terminal being electrically connected to a destination through the terminal pad and wiring within the printed wiring board, said method of making the engineering change comprising the steps of:

placing an insulator between the terminal and the terminal pad; and

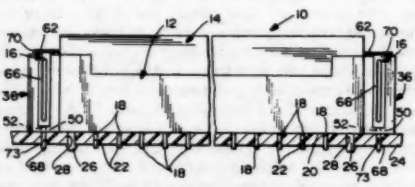
mounting the electronic component on the printed wiring board, wherein the terminal is electrically disconnected from the wiring within the printed wiring board through the insulator.

5,181,318

METHOD OF ASSEMBLING AN ELECTRICAL CONNECTOR

Kenneth F. Janota, Lisle, and Michael J. Miskin, Naperville, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Division of Ser. No. 681,211, Apr. 5, 1991, Pat. No. 5,102,350. This application Dec. 30, 1991, Ser. No. 818,447
Int. Cl.[5] H01R *43/04*
U.S. Cl. 29—882 **4 Claims**



1. A method of assembling an electrical connector for mounting to a substrate such as a printed circuit board, comprising the steps of:

providing an insulative housing having a top, opposite sides and a base portion which is mountable to the printed circuit board:

providing a conductive shield positionable about at least a portion of the housing;

providing a generally U-shaped ground strap having a bight portion spanning proximal ends of a pair of leg portions, the leg portions being configured for depending along opposite sides of the housing with tail portions at distal ends of the legs for projecting beyond the base portion of the housing into holes in the printed circuit board to ground the shield to appropriate ground traces on the board;

positioning the U-shaped ground strap onto the housing with the bight portion of the strap overlying a top surface of the housing and the legs of the ground strap depending along opposite sides of the housing; and

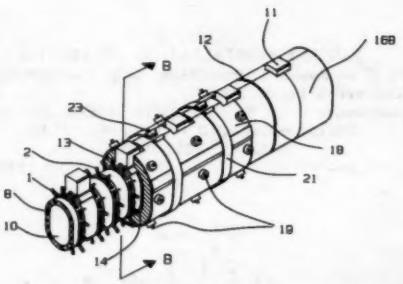
positioning the conductive shield onto the top of the housing in engagement with the ground strap to sandwich a portion of the ground strap between a portion of the shield and the housing.

5,181,319

SQUEEZE-ON INSULATION FOR REHEATING FURNACE WATER COOLED SKID SYSTEMS

Frank Campbell, Jr., 6923 Ashmore Dr., Houston, Tex. 77069

Filed Jan. 9, 1992, Ser. No. 819,301
Int. Cl.[5] B21D *53/00*
U.S. Cl. 29—890.053 **22 Claims**



10. A method of insulating a fluidically cooled pipe having an outer circumference for use in a metallurgical reheat furnace comprising the steps of:

a) applying an anchor band around the outer circumference of the pipe, said anchor band having an ex-tented end and an in-line end, a plurality of radially outwardly projecting prongs disposed between said ends,

b) biasing the two ends of the anchor band so that the ends slidably receive one another and tensioning the anchor band around the pipe so that the anchor band is in thermal communication with the pipe,

c) securing the ends of the anchor band together,

d) applying a preformed insulator laminae comprising an inner ceramic fiber blanket, an outer pliable refractory material and a plastic-like film disposed between and secured to the ceramic fiber and refractory material around the pipe so that the prongs of the anchor band extend through the ceramic fiber blanket and the plastic-like film a sufficient distance into the refractory material to support the insulator laminae around the pipe,

e) positioning a mold form, having a plurality of mold forms segments, around the applied insulator laminae, and

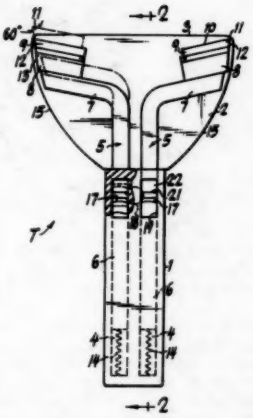
f) compressing the mold form radially inwardly a desired distance so that the insulator laminae is compressed radially inwardly and in substantial conformity with the outer circumference of the pipe.

5,181,320

WALLPAPER TRIMMING TOOL AND ITS METHODS OF USE

John Tucciarone, 69 Whitman Ave., Staten Island, N.Y. 10308

Filed Apr. 29, 1992, Ser. No. 875,451
Int. Cl.[5] B25F *1/00*; B26B *1/00, 5/00*; B28B *1/08*
U.S. Cl. 30—123 20 Claims



1. A trimming tool for trimming the edges of wallpaper, comprising a handle, a blade member secured to said handle and having a guide edge extending traversely of said handle, a pair of opposed arms slidably supported from said handle for movement longitudinally of said handle, a holder on each arm for securing a razor blade therewith, spring means for urging said arms to a retracted position in which the associated razor blades are juxtaposed on the blade member and do not project beyond said guide edge, manually engageable means for the individual displacement of each arm to an extended position against the opposition of said spring means, said razor blades having respective cutting edges which in the extended position of said arms, are disposed in proximity to and slightly beyond the guide edge of said blade member, said guide edge having opposite left and right end regions at which said razor blades are respectively disposed, said arms being individually displaceable to said extended positions, one at a time, to bring the cutting edge of the associated razor blade beyond the guide edge of said blade member.

5,181,321

PROCESS FOR MANUFACTURING CUTTING BLADES

Jean C. Gouttebarge, Cusset, France, assignor to Etablissements Gouttebarge, Chabreloche, France

Filed May 7, 1991, Ser. No. 696,581
Claims priority, application France, Feb. 28, 1991, 91 02769
Int. Cl.[5] B26B *9/02*
U.S. Cl. 30—357 10 Claims

1. A process for manufacturing a cutting blade, comprising the steps of:

bending a portion of a blade blank corresponding to a cutting edge of the cutting blade by tilting said portion at a sharpening angle relative to a longitudinal median plane of the blade blank;

grinding a part of the blade blank which extends beyond the median plane of the blade blank to form said cutting edge and;

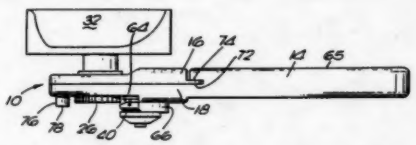
heat treating said blade blank between said bending step and said grinding step.

5,181,322

CAN OPENERS

Vincent H. Koo, Hong Kong, Hong Kong, assignor to Maxpat Trading & Marketing (Far West) Limited, Hong Kong, Hong Kong

PCT No. PCT/GB89/01323, § 371 Date May 7, 1991, § 102(e) Date May 7, 1991, PCT Pub. No. WO90/05108, PCT Pub. Date May 17, 1990
PCT Filed Nov. 6, 1989, Ser. No. 681,549
Int. Cl.[5] B67B *7/00, 7/14, 7/24, 7/32*
U.S. Cl. 30—416 16 Claims



1. A can opener for opening a can having a lid joined to a main body by a rim, in which the can is opened by cutting through an outer part of the rim joining the lid with the main body of the can, in which the can opener comprises a rotatably supported cutter wheel for engaging and cutting the said outer part of the rim, a rotatable drive wheel for engaging the inner part of the rim, means for gripping the rim between the cutter wheel and drive wheel so that, upon rotation of the drive wheel, the can opener orbits around the rim of the can and the cutter wheel can compete a cut around the outer part of the rim, resilient means for allowing the cutter wheel to move resiliently in an axial direction along its axis of rotation, and cam means joined to the cutter wheel and axially spaced from the cutter wheel by a predetermined amount, the cam means being arranged to engage the underside of the rim, the engagement underneath the rim moving the cam means and the cutter wheel against the resilient means to a position such that the cutter wheel makes its cut at a substantially constant predetermined distance up the rim from its lower end.

5,181,323

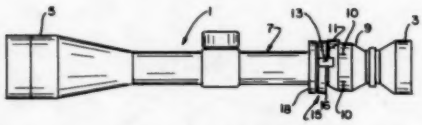
HUNTING SCOPE FOR DETERMINING ACCURATE TRAJECTORY OF A WEAPON

Gary Cooper, Randolph County, Ark.

Division of Ser. No. 650,210, Feb. 4, 1991, abandoned. This application Oct. 31, 1991, Ser. No. 770,106
Int. Cl.[5] F41G *1/38*
U.S. Cl. 33—245 4 Claims

1. A variable power hunting scope having an objective and

an eyepiece, a barrel intermediate said eyepiece and objective, said barrel carrying a reticle, a zoom assembly, a vertical cross-hair, a horizontal cross-hair, vertical and horizontal posts, and an adjusting ring for altering the magnification of said scope, wherein said scope includes locking means for



interferring with rotation of said adjusting ring of a desired maximum magnification setting, said desired maximum magnification setting being less than the maximum magnification of said scope and greater than the minimum magnification of said scope.

5,181,324

SUNDIAL

Piet Hein, Damsbo, Denmark, assignor to Piet Hein A/S, Middelfart, Denmark

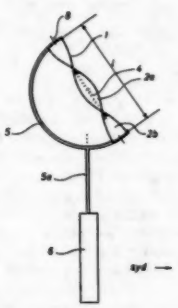
PCT No. PCT/DK90/00110, § 371 Date Dec. 19, 1991, § 102(e) Date Dec. 19, 1991, PCT Pub. No. WO90/13854, PCT Pub. Date Nov. 15, 1990

PCT Filed Apr. 27, 1990, Ser. No. 772,354

Claims priority, application Denmark, Apr. 28, 1989, 2096/89

Int. Cl.[5] G04B *49/02*

U.S. Cl. 33—270 **9 Claims**



1. A sundial, comprising:

a strip-shaped body having two opposite faces, two opposite ends, two opposite edges and a longitudinal axis, said body being longer than it is wide, and wider than it is thick; both of said faces being provided as respective helicoidal surfaces extending helicoidally about said longitudinal axis, and between said ends and said edges; means providing a longitudinally extending series of time markings on at least one of said helicoidal surfaces; and

a base; said body being arranged to be supported on said base with said longitudinal axis parallel to the earth's axis of rotation, and so that as the earth rotates, said body casts a shadow at least partly defined by a said edge thereof generally crosswise of said strip on at least one of said surfaces having said series of time markings thereon, as a sole shadow-based visual indication of time of day provided by said sundial.

5,181,325

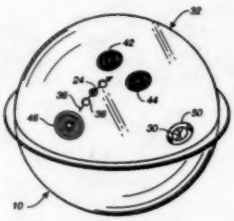
SYSTEM FOR DUPLICATING BOWLING BALL FINGER AND THUMB HOLES

Gary Damon, 6750 Regional St., Dublin, Calif. 94568

Filed Jul. 6, 1992, Ser. No. 908,036

Int. Cl.[5] G01B *3/14*

U.S. Cl. 33—510 **15 Claims**



12. Apparatus for transferring finger and thumb hole locations from a first bowling ball having finger and thumb holes to a second bowling ball, said apparatus comprising, in combination:

a substantially transparent template for sequential placement on said first bowling ball and on said second bowling ball, said template having an inner surface with a configuration generally conforming to the outer surfaces of said first bowling ball and said second bowling ball;

finger and thumb hole marker elements on said template, said finger and thumb hole marker elements being spaced from one another and at locations on said template corresponding to the locations of the first bowling ball finger and thumb holes; and

a positive axis point marker element spaced from the finger and thumb hole marker elements and corresponding to the location of the positive axis point of said first bowling ball, at least some of said marker elements being adhesively secured to said template.

5,181,326

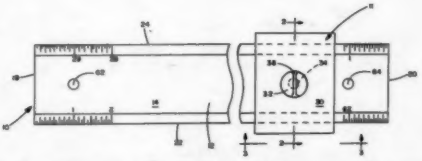
TOOL AND METHOD FOR INSTALLING TILE

Joseph Eb[illegible]ne, 611 El Placer Rd., Palm Springs, Calif. 92264

Filed Dec. 23, 1991, Ser. No. 813,116

Int. Cl.[5] G01B *3/30*

U.S. Cl. 33—527 **7 Claims**



1. A tool for marking tiles having a predetermined thickness, so that said tiles may be cut precisely to enable said tiles to be placed adjacent each other and spaced apart a predetermined, selected distance,

said tool comprising

a rectilinear bar having a pair of opposed ends, a pair of opposed sides, and top and bottom opposed faces,

a slide element carried by the bar and movable along the length of the bar between said ends,

said slide element having a body member which is supported by the top face and has a pair of opposed arms extending along said sides, each of said arms having a finger which extends beyond the bottom face, each of said fingers having a predetermined thickness which facilitates marking

and cutting said tile so that, upon installation, adjacent tiles shall be spaced apart said predetermined, selected distance,

at least one of said sides having a groove along at least a portion of the length of the bar and at least one of said arms having a guide member which rides in said groove as the slide element slides along the bar, and

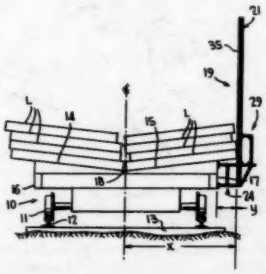
fastener means for holding the slide element in a selected position along said bar.

5,181,327

LOADWIDTH GAUGE FOR RAILWAY CARS

Charles S. Powell, Roanoke, Va., assignor to Norfolk Southern Railway Co., Norfolk, Va.

Filed Mar. 31, 1992, Ser. No. 861,098
Int. Cl.[5] G01B 5/14
U.S. Cl. 33—833 **4 Claims**



1. A gauge for determining the maximum width of a load of materials supported on a railway car having opposing upstanding side sills, the materials extending outwardly beyond said side sills, the gauge comprising a hand-held device having an upstanding elongated boom, foot means connected to said boom and transversely extending from one side of said boom for slidingly bearing against each of said side sills, a terminal end of said foot means being spaced a predetermined fixed distance from said boom for determining the maximum load-width by gauging the outward extent of the materials, and means mounted on an opposite side of said boom for manually holding the device and for sliding the device along each of said side sills in a direction along the length of the railway car while said foot means slidingly engage each of said side sills, whereby any extent of the material elements beyond said predetermined fixed distance from each of said side sills is gauged by said boom upon the sliding of the device to thereby determine the maximum width of the load of materials on the car.

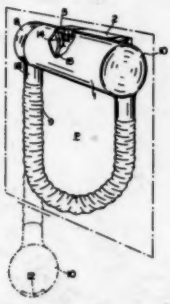
5,181,328

WALL-MOUNTED HAIR DRYER

Alain P. C. Bouverie, Cerizy-La-Foret, France, assignor to Moulinex (Societe Anonyme), Bagnolet, France

Filed Nov. 26, 1991, Ser. No. 798,145
Claims priority, application France, Dec. 6, 1990, 90 15312
Int. Cl.[5] A45D 20/08
U.S. Cl. 34—97 **6 Claims**

1. Hair dryer comprising a housing (1) having securement means for mounting on a vertical surface (P), said housing containing a hot air generator group with a motor ventilator (3–4) controlled by an electric switch (5) and adapted to establish a current of air between an air inlet opening (6) and a hot air outlet opening (7) receiving a connector (8) secured to a flexible tube (9) provided with a hair drying nozzle (10), said nozzle being, either into a retracted or rest position in which the switch (5) is in an open condition, or into a use position in which the switch is in a closed position and permits drying of the hair; wherein the connector (8) is rotatably movably mounted on said hot air outlet opening (7), and comprises actuating means (14) for the switch (5) such that the movement of the drying nozzle (10) from its retracted or rest position to its use position brings, by transmission of the movement of said nozzle (10) to the connector (8) by means of the flexible tube (9), the switch (5) into its closed position, and such that the



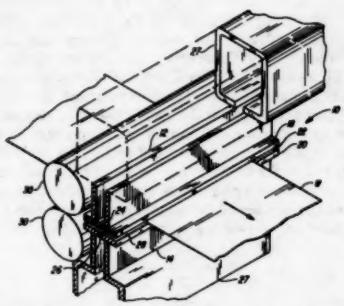
movement of the drying nozzle from its use position to its retracted or rest position brings, also by transmission of the movement of said nozzle to the connector, the switch into its open position.

5,181,329

DRYING APPARATUS

Mark J. Devaney, Jr., Rochester; Lee F. Frank; Jeffrey L. Helfer, both of Webster; Haribhajan S. Kocher, Penfield, and Paul M. Wagner, Holley, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1990, Ser. No. 633,507
Int. Cl.[5] F26B 13/00
U.S. Cl. 34—156 **7 Claims**



1. Apparatus for drying a web comprising:

a pair of spaced parallel members having flat surfaces defining a channel there between of predetermined length and thickness for transport of the web there between;

juxtaposed elongated openings in said surfaces respectively;

means for supplying air under pressure to said openings to establish cushions of air on opposite sides of the web and a high velocity laminar flow of air in opposite directions from said openings over the surface of the web, the web being supported in said channel by said cushions of air and said laminar flow of air;

and means for evacuating air from said channel on opposite sides of the web at a predetermined distance from said openings to maintain the heat transfer rate in the air in said channel higher than the heat transfer rate in the web.

5,181,330

DEVICE FOR ASSEMBLING SUPERPOSED, GLUED WEB-LIKE LAYERS

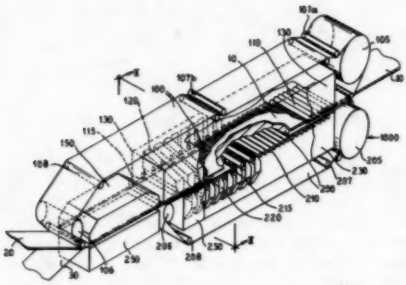
Gregor Schoch, Morges, Switzerland, assignor to Bobst SA, Switzerland

Filed Nov. 8, 1991, Ser. No. 790,592

Claims priority, application Switzerland, Nov. 14, 1990, 03617/90

Int. Cl.[5] F26B *13/06*

U.S. Cl. 34—162 **9 Claims**



6. A device for assembling a pair of webs, with one of the pair of webs having flutes to form a web of corrugated board material, said device including conveyor means, a first heating section, a second section and a third section, said conveying means including an upper continuous mesh belt extending over an inlet drum and an outlet drum, said first section including a single heating plate being positioned with a planar upper surface facing the path of the upper belt and a blowing case positioned on the opposite side of the upper belt to direct pulsating air toward said upper surface, said second section being a drying and pulling section including an upper suction case extending the length of the second section and the third section, said upper suction case, in the second section, having a plurality of upper slot-shaped parallel extending nozzles arranged to extend perpendicular to the direction of movement of the belt through said section for directing air downward through the mesh belt, said conveying means including a lower continuous mesh belt extending over a lower inlet drum and a lower outlet drum, with the lower inlet drum being positioned at the beginning of the second section and the lower outlet drum being positioned at the end of the third section so that a portion of the lower belt moves with a portion of the upper belt through the second and third sections, a plurality of supporting rollers for holding the portion of the lower belt against the upper belt and a plurality of pressure rollers being disposed between the nozzles of the second section and being provided in the third section for urging the upper belt against the lower belt.

5,181,331

SHOE WITH FLEXIBLE UPPER MATERIAL PROVIDED WITH A CLOSING DEVICE

Christoph Berger, Wie Postanschrift, Fed. Rep. of Germany, assignor to Puma Rudolf Dassler Sport, Herzogenaurach, Fed. Rep. of Germany

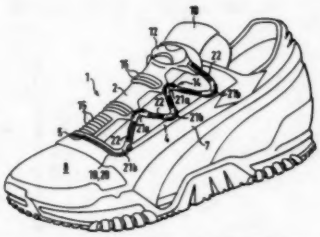
Division of Ser. No. 532,278, Jun. 4, 1990, Pat. No. 5,117,567. This application Mar. 27, 1992, Ser. No. 858,520

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1989, 8906840; Oct. 28, 1989, 8912788; Feb. 13, 1990, 9001645; May 15, 1990, 9005496

Int. Cl.[5] A43B *11/00*

U.S. Cl. 36—50.1 **13 Claims**

1. Shoe provided with a closing device, especially a sport, play or rehabilitation shoe, having an upper of at least one material that is flexible under tensile stresses in a throat area of the upper, and with an instep shield which covers an instep area and to which side parts of the upper are adjustably fastenable on opposite sides of the instep shield by at least one tightening element; wherein a respective closing flap made of an elastic or springy elastic material is permanently attached on a respective side part of the upper adjacent a respective side of the instep shield and is displaceable relative to said respective side of the instep shield by said at least one tightening element, each closing flap running in a direction away from a toe area of the upper toward an ankle opening of the upper while being oriented, at most, at a small, acute angle relative to the instep shield; wherein the closing device comprises at least one central tightening lock which forms a means for drawing the closing flaps, as well as the side parts of the shoe upper that are



permanently attached to them, toward the instep shield by said at least one tightening element, said at least one tightening element being connected thereto; wherein the at least one central tightening lock is provided on the instep shield; wherein each of the closing flaps is provided with a plurality of guide blocks, each guide block having a guide channel for the at least one tightening element; wherein the instep shield is provided with guides having guide channels for the at least one tightening element; wherein the at least one tightening element connects the closing flaps and passes over the instep shield in a manner that is crossing-free, at least at upper and lower parts of the instep shield, wherein the tightening element is a Bowden cable.

5,181,332

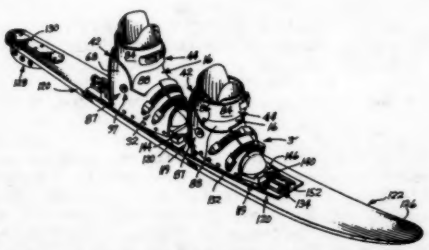
WATER SKI BOOT AND BINDING

Dean P. Uren, 31654 N.E. 106th, Carnation, Wash. 98014, and James D. Anderson, 10312 164th Ave. N.E., Redmond, Wash. 98052

Continuation of Ser. No. 498,378, Mar. 26, 1990, abandoned. This application Oct. 28, 1991, Ser. No. 794,801

Int. Cl.[5] A43B *5/04;* **A63C** *5/00*

U.S. Cl. 36—114 **69 Claims**



1. In a high top boot with which a user can mount his foot on a water ski and undergo water skiing thereon, the combination of

an open topped shoe structure in which the user can insert the base of his foot, including an elongated sole plate for use under the plantar surface of his foot, means that operatively define a holster within which the user can engage

the metatarsal portion of his foot when the base of it is supported on the sole plate, and a wall structure that is substantially rigidly upstanding on the sole plate about the tarsal portion of the user's foot when the metatarsal portion of it is so engaged within the holster,

said wall structure including a rear wall that upstands at the back of the shoe structure to a level above the ankle joint of the user's foot, to form a strongback for the achilles tendon of his foot,

and a cuff-like superstructure which is engageable about the user's ankle when the base of his foot is inserted in the shoe structure, including a part annular upper cuff which is adapted to be removably secured about the user's lower leg above the ankle joint therein, and which is supported on the shoe structure at the top opening thereof, so as to have no more than limited capability to flex in relation to the shoe structure laterally thereof,

said upper cuff being pivotally mounted on the wall structure to assume a normally upright position adjacent the strongback when the user's leg is relaxed and straightened at the knee,

means for releaseably detaining the upper cuff in the normally upright position thereof,

said upper cuff and holster having terminal edge portions thereof which oppose one another across the instep of the user's foot, and which are spaced apart from one another by a gap when the upper cuff is releaseably detained in the normally upright position thereof, and

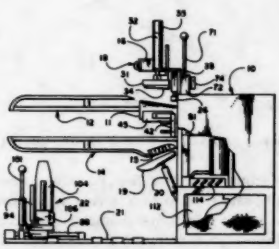
means in the releasable detention means and means in the gap and across the instep of the boot opposite the gap whereby the upper cuff can pivot in conjunction with the user's lower leg, relative to the shoe structure, at angles sufficiently upward of about 70° that the user can pivot his lower leg over the full range of positions needed for waterskiing, including the low angle position of dorsiflexure needed when he squats or crouches for startup.

5,181,333

HEIGHT ADJUSTABLE PANTS PRESSER WITH TOP FINISHING

Stephen F. Gilbert, Jonesboro, Ga., assignor to Paris Manufacturing Co., Inc., Jonesboro, Ga.

Filed Jul. 30, 1991, Ser. No. 738,205
Int. Cl.[5] D06F *71/28*
U.S. Cl. 38—15 **16 Claims**



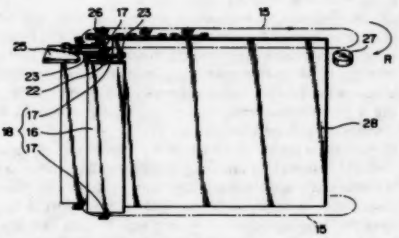
1. In a pants finishing apparatus including a cabinet, a plurality of creasing blades supported by said cabinet, and means for steaming a pair of pants held on said creasing blades, the improvement comprising at least one topping buck supported by said cabinet, one creasing blade of said plurality of creasing blades extending from said at least one topping buck, a pressing plate selectively engageable with said topping buck, and means for introducing steam into said topping buck independent of said means for steaming said pair of pants, and waist clamping means, said waist clamping means including at least one clamping plate selectively engageable with the waist of said pair of pants.

5,181,334

DISPLAY APPARATUS

Yoshinobu Mima, Hyogo, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan

Continuation of Ser. No. 653,519, Feb. 11, 1991, abandoned.
This application May 18, 1992, Ser. No. 884,896
Claims priority, application Japan, Mar. 5, 1990, 2-51763
Int. Cl.[5] G09F *11/12*
U.S. Cl. 40—524 **4 Claims**



1. A display apparatus comprising:

a drive shaft having a drive wheel secured thereto;

a driven shaft having a driven wheel secured thereto;

an endless drive member rotatably wound on said drive wheel and said driven wheel, thereby forming an elongated oval travel path comprising two straight portions and two semicircular portions;

a plurality of display plates, each display plate comprising a plate-like panel portion having a front surface and a back surface, display surfaces on said front and back surfaces thereof, and shaft portions provided at upper and lower ends of said panel portion, said shaft portions being rotatably supported by said drive member, said display plates being divided in two groups that are positioned at two opposing regions of said drive member;

a display window, said plurality of display plates being viewed through said display window;

first and second projections projecting from said shaft portions of the display plates;

a first guide member provided in one semicircular portion of said elongated oval travel path of said drive member, said first guide member having cams that guide said first and second projections in such a way as to prevent said first and second projections from rotating in said semicircular portion of said elongated oval travel path relative to said display window; and

a second guide member provided in a second semicircular portion of said elongated oval travel path of the drive member, said second guide member having a cam that guides said second projections and causes said second projections to rotate a half turn in said second semicircular portion of said elongated travel path relative to said display window.

5,181,335

PORTABLE SIGN INSTALLATION KIT AND METHOD OF USING SAME

Harry V. Todd, El Cajon, Calif., assignor to T. Diamond Enterprises, El Cajon, Calif.

Continuation of Ser. No. 625,932, Dec. 10, 1990, abandoned.
This application Dec. 13, 1991, Ser. No. 808,202
Int. Cl.[5] G09F *15/00*
U.S. Cl. 40—607 **18 Claims**

1. A portable sign support kit, comprising:

a sign for displaying a message, said sign including front and rear flat face portions, upper and lower portions, and upper and lower marginal edges, without rearwardly extending protrusions;

a mounting standard having a generally front flat imperforate surface for receiving and engaging said sign along a

continuous line of engagement therewith and having a rear flat surface to help facilitate driving the standard into the ground;

a mounting bracket dimensioned for receiving a portion of said mounting standard therein;

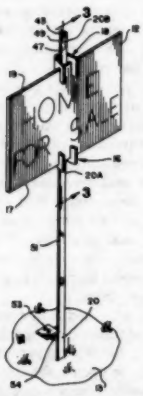
said mounting bracket having a pair of spaced-apart downwardly extending sign receiving open slots;

each one of said downwardly extending slots terminating at a lower edge of said mounting bracket and configured in a shape substantially complementary to a marginal edge portion of said sign for receiving it;

each one of said downwardly extending slots including substantially equally sized spaced apart front and rear side edges for accommodating signs, having flat front and rear face portions, of different thicknesses thereinbetween;

said mounting bracket being generally U-shaped and including a pair of outwardly flared sidewall portions in their normal unstressed conditions;

said pair of sidewall portions being composed of flexible resilient material for enabling said sidewall portions to flex inwardly toward one another into a generally parallel disposition in response to manually applied forces by the user for helping to receive said sign within said downwardly extending slots and to snap back away from one another to grip forcible said sign therewithin when the



user releases the manually applied forces on said sidewall portions so that said mounting bracket can secure said sign from the top prior to clamping said sign to said mounting standard thereby facilitating signal installation;

clamping means mounted threadably to said bracket for pressing said mounting standard front flat surface forcibly against an upper portion of said sign to clamp an upper portion of said sign between the rear side edges of said downwardly extending slots and said mounting standard, said clamping means engaging said rear flat surface of said mounting standard to press it flat against said sign to inhibit rotation of said sign relative to said mounting standard;

another mounting bracket dimensioned for receiving another portion of said mounting standard therein;

said other mounting bracket having a pair of spaced-apart upwardly extending U-shaped open sign receiving slots;

each one of said upwardly extending slots terminating at an upper edge of said other bracket an configured in a shape substantially complementary to another marginal edge portion of said sign for receiving it;

each one of said upwardly extending slots including substantially equally sized spaced apart front and rear side edges for accommodating signs having flat front and rear face portions of different thicknesses thereinbetween;

said other mounting bracket being generally U-shaped and including another pair of outwardly flared sidewall portions in their normal unstressed conditions;

said other pair of sidewall portions being composed of flexible resilient material for enabling said sidewall portions to flex inwardly toward one another into a generally parallel disposition in response to manually applied forces by the user for helping to receive said sign within said upwardly extending slots and to snap back away from one another to grip forcibly the sign therewithin when the user releases the manually applied forces on said sidewall portions so that said other mounting bracket can secure said sign from the bottom, prior to clamping said sign to said mounting standard thereby facilitating sign installation; and

another clamping means mounted threadably to said other bracket for pressing said other portion of said mounting standard forcibly against a lower portion of said sign to clamp the lower portion of said sign between the rear side edges of said upwardly extending slots and said mounting standard, whereby said flat rear face of said sign is clamped to said flat surface of said mounting standard to engage said sign along a continuous line of engagement from its top to its bottom.

5,181,336

FIXED GUIDE MOUNTING STRUCTURE

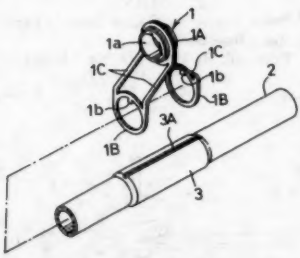
Toshihiko Yasui, Tondabayashi, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Nov. 25, 1991, Ser. No. 797,064

Claims priority, application Japan, Nov. 29, 1990, 2-127991[U]

Int. Cl.[5] **A01K** *87/04*

U.S. Cl. 43—24 **8 Claims**



1. A fishing rod provided with a fixed line guide (1) comprising:

a rod body comprised of a first portion (2) and a second portion (3), said first portion having a substantially circular cross-section with a first diameter, said second portion having a substantially circular cross-section with a second diameter, said second portion being coaxial with respect to said first portion, and said diameter of said second portion being greater than said diameter of said first portion, and wherein said second portion has a longitudinally extending engaging recess (3A) formed therein; and

wherein said fixed line guide (1) is overlaid on said second portion of said rod body; and

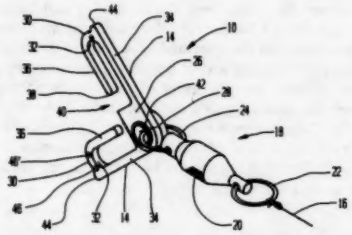
wherein said fixed line guide includes a guide engaging projection (1*b*), and wherein said guide engaging projection is engaged within said engaging recess to prevent said fixed line guide from moving with respect to said rod body.

5,181,337

ESCAPE PROOF FISH HOOK CONNECTOR

Edward J. DuBois, 6501 Alicia Pl., Grand Rapids, Minn. 55744

Filed Feb. 18, 1992, Ser. No. 838,587
Int. Cl.[5] A01K *91/04*
U.S. Cl. 43—44.83 **17 Claims**



1. A device for facilitating the quick connection and disconnection of fish hook means to an end of a fishing line, said device comprising a sister hook arrangement including a pair of discrete sister elements wherein each of said discrete sister elements includes a first end and a second end, said first end of each sister element including an aperture and each said second end including a generally U-shaped hook having a bight portion, a connector leg connecting the bight portion to each respective first end, and a leg having a free end forming, with the respective first end, an access opening, means cooperating with said apertures for pivotally attaching said sister elements relative to one another, and extension means disposed on each of said sister elements for facilitating pivoting of said sister elements from a closed position wherein the sister elements are generally aligned with one another to an open position wherein unrestricted access to each respective access opening is permitted, whereby said fish hook means is engageable on a u-shaped hook of one of said sister elements when said sister elements of said sister hook arrangement are in the open position and positioning of the fish hook means generally in the u-shaped hook of both sister elements after said sister elements are pivoted to and aligned in the closed position precludes disengagement of the fish hook means from the device by preventing pivoting of the sister elements relative to one another.

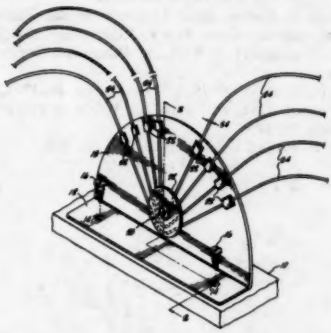
5,181,338

BIRD DETERRENT METHOD AND DEVICE

Victor H. Chatten, 1567 West 215th St., Torrance, Calif. 90501

Continuation-in-part of Ser. No. 780,377, Oct. 3, 1991, abandoned, which is a continuation of Ser. No. 557,411, Jul. 23, 1990, abandoned. This application Jun. 2, 1992, Ser. No. 892,557
Int. Cl.[5] A01M *1/10*
U.S. Cl. 43—58 **31 Claims**

1. A bird deterrent device comprising:
a base, with a flange projecting from said base, said flange having a plurality of perforations thereon;
a bore placed through said flange;
a pin engaging said bore, said pin having a head and a blunt end thereon;
a washer placed on said pin; and
a multiplicity of projecting members, contiguous with said flange and extending outward therefrom, said projecting members positioned adjacent to said pin and abutting said



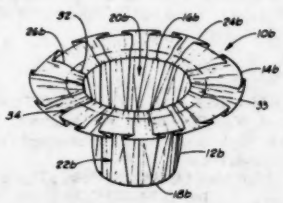
washer, each of said projecting members also being contiguous with two of said perforations.

5,181,339

FLOWER POT OR FLOWER POT COVER WITH PLEATED SKIRT AND OR BASE

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Division of Ser. No. 397,114, Aug. 22, 1989, Pat. No. 5,029,412, which is a continuation-in-part of Ser. No. 366,588, Jun. 15, 1989, Pat. No. 5,111,613, which is a continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031. This application May 1, 1991, Ser. No. 693,906
Int. Cl.[5] A01G *9/02*
U.S. Cl. 47—72 **34 Claims**



1. A flower pot or flower pot cover, comprising:
a base having an upper end and a lower end with an object opening extending through the upper end and having a plurality of overlapping folds formed in the base for cooperating to provide structural integrity to the base; and
a skirt connected to the upper end of the base and extending a distance outwardly from the upper end of the base terminating with an outer peripheral surface, the skirt having a plurality of folds extending from about the upper end of the base outwardly to the outer peripheral surface of the skirt, a portion of the folds in the skirt between a position near the upper end of the base and spaced a distance from the outer peripheral surface of the skirt toward the upper end of the base being permanently connected forming connected folds with said portion having the connected folds extending circumferentially about the skirt, and a remaining portion of the folds between the outer peripheral surface of the skirt and said portion with the connected folds being unconnected with said remaining portion extending circumferentially about the skirt.

5,181,340

WINDOW WITH A MAIN FRAME FOR INSTALLATION IN AN INCLINED ROOF AND TWO OPENABLE WINDOW FRAMES

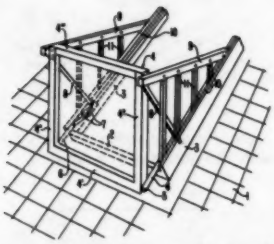
Claes Lindgren, Farum; Brent Moller, Gentofte; Flemming O. Petersen, Bloustrod, and Stig F. Vigenberg, Gilleleje, all of Denmark, assignors to V. Kann Rasmussen Industri A/S, Soborg, Denmark

PCT No. PCT/DK89/00029, § 371 Date Jun. 21, 1991, § 102(e) Date Jun. 21, 1991, PCT Pub. No. WO90/09493, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 15, 1989, Ser. No. 688,548

Int. Cl.[5] E06B *3/34*

U.S. Cl. 49—371 2 Claims



1. A window for installation in an inclined roof (1), comprising a main frame (2; 3) and upper and lower openable window frames (4; 12) journalled in the main frame one above the other to cover the main frame opening in their closed position, said upper openable frame being pivotally hinged to the main frame at its top side and said lower openable frame being pivotally hinged to the main frame at its bottom side to permit outwards turning of said upper and lower frames into substantially horizontal and vertical open positions, respectively, characterized in that the lower frame (4) includes a bottom section which is pivotally hinged to a supporting means which is connected with the main frame (2; 3) to allow downwards displacement of said bottom section (4') away from a bottom section (2) of the main frame in a direction substantially parallel to the plane of the main frame towards said vertical open position of the lower frame.

5,181,341

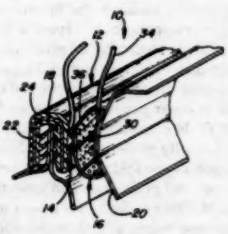
VARIABLE GAP FILLING SYSTEM

James F. Keys, West Bloomfield, and Douglas C. Larsen, Milford, both of Mich., assignors to The Standard Products Company, Cleveland, Ohio

Filed May 14, 1990, Ser. No. 523,052

Int. Cl.[5] E06B *7/16*

U.S. Cl. 49—477 22 Claims



1. A variable gap sealing article for sealing between a first surface and a second surface spaced from one another, said article comprising:

an elongated body portion having a width, a first sealing surface on a first side of said width for sealing against said first surface and a second sealing surface on a second side of said width for sealing against the second surface; said body portion including a resilient first contractible portion and a second expandable and conformable portion; and

means for contracting said first contractible portion into a contracted position and expanding said second expandable portion into an expanded position such that the expandable portion conforms to the shape of said second surface, the means for contracting and expanding including means for accepting a hardening substance, said hardening substance retaining the expandable portion in the conformed shape and the contractible portion in the contracted position, wherein the resiliency of the contractible portion biases the article against the first surface and the second surface, and wherein the width of the expanded expandable portion and the contracted contractible portion varies in width for bridging the gap between the first surface and the second surface.

5,181,342

SANDER WITH ORBITING PLATEN AND ABRASIVE

Donald E. Haney, 11376 Ramsey Rd., Gold Hill, Oreg. 97525

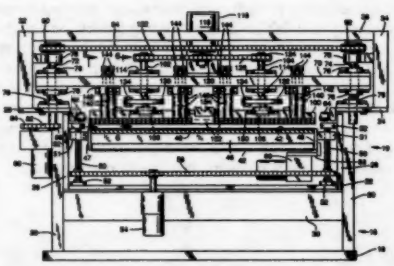
Division of Ser. No. 568,902, Aug. 17, 1990, Pat. No. 5,081,794.

This application Nov. 5, 1991, Ser. No. 787,897

The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.

Int. Cl.[5] B24B *7/06, 7/02*

U.S. Cl. 51—60 27 Claims



1. A sander comprising:

an elongate platen with a substantially flat contact surface;

an abrasive sheet;

a securing device for holding the abrasive sheet on the platen's contact surface;

a brace:

a drive mechanism having at least two power-driven shafts interconnecting the platen and the brace at spaced locations for moving the platen and abrasive sheet in a translational motion and for stabilizing the platen;

at least one yieldably resilient stabilizer operatively interposed between the platen and the brace to stabilize the platen; and

a conveyor adjacent the platen for conveying products to be sanded in a feed direction toward the platen while the platen moves;

where the elongate platen is positioned substantially across the conveyor and where the abrasive sheet's motion is solely dependent on and controlled by the platen's motion; and

where the yieldably resilient stabilizers are adjustable to apply various predetermined pressures to the platen.

5,181,343

APPARATUS AND PROCESS FOR GRINDING A PROFILE OF A BAND SAW

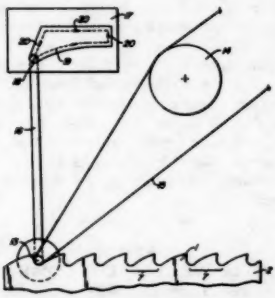
Jeremias Teunissen, Weteringpad 1, 3762 En Soest, Netherlands

Continuation of Ser. No. 490,589, filed as PCT/NL89/00047 on Jun. 9, 1989, abandoned. This application Nov. 26, 1991, Ser. No. 799,709

Claims priority, application Netherlands, Jun. 10, 1988, 8801491

Int. Cl.[5] B24B *21/00*

U.S. Cl. 51—135 R 6 Claims



1. An apparatus for the grinding of a profile of a band saw, which apparatus is provided with an abrasive medium disposed above a track along which the band saw is conducted under operating conditions and whereby a relative motion between the band saw and the abrasive medium can be effected in the plane of the band saw for the grinding of individual consecutive parts of the profile of the band saw, characterized in that the abrasive medium substantially consists of an endless grinding belt which can circulate continuously in the plane of the band saw over at least one pressure pulley and means whereby said band saw effects its whetting action while moving in the longitudinal direction over a specific part of the band-saw profile during at least one part of the said motion in the plane of the band saw.

5,181,344

DEVICE FOR FASTENING A HOLDING PART ON AN EYEGLASS LENS

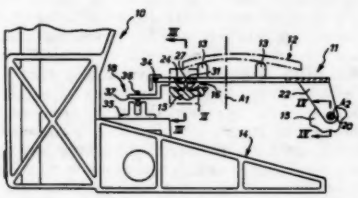
Christian Joncour, Saint Maurice; Alain Chansavoir, Luzancy, and Bruno Marande, Sannois, all of France, assignors to Essilor International CIE Generale d'Optique, Creteil Cedex, France

Filed Oct. 11, 1991, Ser. No. 775,021

Claims priority, application France, Oct. 25, 1990, 90 13234

Int. Cl.[5] B24B *13/05*

U.S. Cl. 51—165.75 15 Claims



1. Device for fitting a holding part onto an eyeglass lens comprising a plate adapted to receive the eyeglass lens pivoted to a fixed base and calibrated spring means and a displacement sensor operative between said plate and said base.

5,181,345

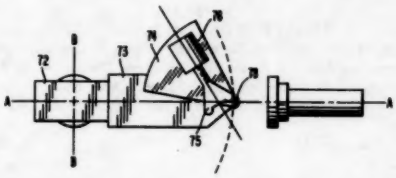
LENS GRINDING METHOD AND APPARATUS

Stephen Kulan, Gibson, Okla., assignor to Coburn Optical Industries, Inc., Tulsa, Okla.

Continuation of Ser. No. 510,834, Apr. 18, 1990, abandoned. This application Jun. 16, 1992, Ser. No. 899,131

Int. Cl.[5] B24B *49/02, 51/00*

U.S. Cl. 51—165.77 2 Claims



1. Lens grinding apparatus capable of generating in a lens blank a power curve of less than three diopters and having both a base curve characteristic and a cross curve characteristic, said apparatus comprising:

base means having a lens supporting means and a tool supporting means mounted thereon,

said lens supporting means comprising a tailstock mounted on said base means for movement toward and away from said tool supporting means and including means for supporting a lens blank,

said tool supporting means comprising a plate pivotably mounted on said base means, first slide means slidably mounted on said plate, second slide means pivotably mounted on said first slide means, and a tool block mounted on said second slide means for rotating a cup-shaped tool about a tool axis of rotation,

said plate being pivotably mounted for pivoting movement relative to said base means about an upright first axis to sweep said tool across a lens blank mounted in said lens supporting means for simultaneously cutting in the lens blank a base curve characteristic and a cross curve characteristic, said base curve characteristic being less than three diopters and having a center of curvature spaced from said first axis,

said tool axis of rotation and a radius of curvature of said base curve characteristic forming therebetween an effective head angle defining said cross curve characteristic,

said first slide means being slidable relative to said plate along a second axis oriented generally perpendicularly to said first axis for varying a sweep radius defined as a distance between said tool and said first axis, a sweep angle formed between said second axis and a line intersecting said first axis and a center of a lens blank,

said tool axis of rotation and said second axis forming therebetween a real head angle,

said second slide means being pivotably mounted on said first slide means for pivotal movement about a third axis oriented generally perpendicularly to said second axis for changing said real head angle,

actuating means for sliding said first slide means relative to said plate along said second axis, and for pivoting said second slide means relative to said first slide means about said third axis,

sensing means for continuously determining said sweep angle and generating a signal indicative thereof, and

a micro-processor operably connected to said sensing means and said actuating means for

receiving said signal and continuously calculating, as a function of both said sweep angle and said base and cross curve characteristics,

a value of said sweep radius necessary to maintain said radius of curvature constant, and

a value of said real head angle necessary to maintain said effective head angle constant, and

operating said actuating means for continuously sliding said first slide means relative to said plate to establish said calculated sweep radius, and for continuously pivoting said second slide means relative to said first slide means about said third axis to establish said calculated real head angle.

5,181,346

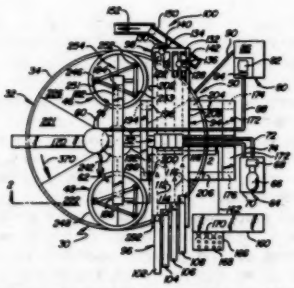
THRU-FEED LAPPING APPARATUS

Joseph Paliwoda, West Bloomfield; Robert B. Casadonte, Clawson, and Ronald R. Reinke, Drayton Plains, all of Mich., assignors to Deco-Grand, Inc., Royal Oak, Mich.

Filed Aug. 13, 1990, Ser. No. 566,482

Int. Cl.[5] B24B *1/00, 7/04*

U.S. Cl. 51—327 **20 Claims**



16. A method of automatically lapping multiple identical parts using a generally circular lapping table having a lapping work surface which rotates continuously about a central axis, comprising:

feeding the multiple identical parts to be lapped single file along a first predetermined path across the work surface of the rotating table;

at a first location along the first predetermined path, stopping the forward motion of a first part in the process of being lapped for a first predetermined amount of time, and then releasing the part to move along the path again; and

at a second location along the first predetermined path spaced from the second location, stopping the forward motion of a first part in the process of being lapped for a first predetermined amount of time, and then releasing the part to move along the path again.

5,181,347

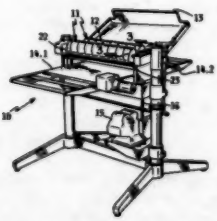
DRUM SANDER AND FASTENERS

Gary L. Green, 17065 Judicial Rd., Lakeville, Minn. 55044

Filed Jul. 18, 1991, Ser. No. 732,466

Int. Cl.[5] B24B *45/00*

U.S. Cl. 51—370 **10 Claims**



1. In combination with a rotatable sanding drum for sanding an object and being operated by a rotary drum sander, a fastener apparatus for securing abrasive paper to the rotatable sanding drum, the combination comprising:

a) a rotatable sanding drum for being operated on the rotary drum sander, the drum comprising first and second drum ends, each of said ends having a slot therein for passing a strip of abrasive paper therethrough;

b) a strip of abrasive paper for being wound on the rotatable drum from the first to second drum end, the strip comprising first and second strip end portions;

c) means connectable to the drum for fastening the first strip end portion to the first drum end, said means comprising a fixed plate member adjacent said slot, and a spring-biased lever arm having a pivotal clamping end and including a torsion spring biased toward said plate member, and

means connectable to the drum for connecting the second strip end portion to the second drum end, the connecting means comprising a spring-biased take-up means for taking up slack in the strip of abrasive paper as the drum is operated, a plate member affixed to said take-up means, and a spring-biased lever arm having a pivotal clamping end and including a torsion spring biased toward said plate member.

5,181,348

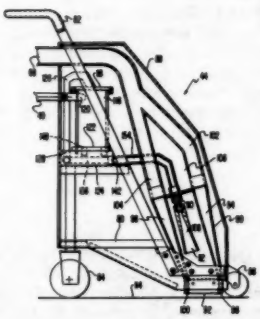
ABRASIVE CLEANING APPARATUS

Carl F. Roemmele, Leawood, and Donald F. Meister, Overland Park, both of Kans., assignors to Target Products, Inc., Kansas City, Mo.

Filed Apr. 5, 1991, Ser. No. 680,770

Int. Cl.[5] B24C *3/00*

U.S. Cl. 51—410 **24 Claims**



1. An abrasive cleaning device for cleaning a surface by directing streams of abrasive particles from a plurality of nozzles against the surface comprising a housing means defining an internal nozzle chamber having an open end, a plurality of nozzle means mounted within said housing means for directing streams of abrasive particles toward said open end of said nozzle chamber, particle divider means connected to said plurality of nozzle means, said particle divider means operating to receive a supply of pressurized air containing abrasive particles and to supply therefrom separate streams of pressurized air of substantially equal pressure and each containing substantially equal amounts of abrasive particles to said plurality of nozzle means whereby each of said nozzle means receives one of said separate streams, and supply means connected to said particle divider means for supplying pressurized air containing abrasive particles, said particle divider means including separator means for separating the abrasive particles from the pressurized air supplied by said supply means and manifold means connected to receive the separated pressurized air and abrasive particles from said separator means, said manifold means operating to provide separate streams of pressurized air of substantially equal pressure containing substantially equal amounts of

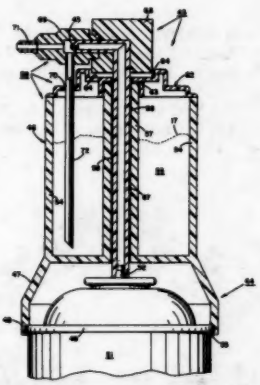
abrasive particles, each said stream being provided to one of said nozzle means.

5,181,349

SELF-POWERED UNITARY PORTABLE GRANULAR PARTICLE EJECTOR TOOL

Stephen C. Schaffer, Brookfield, Conn., assignor to Sandair Nevada, Inc., Las Vegas, Nev.

Continuation-in-part of Ser. No. 762,920, Sep. 19, 1991, abandoned. This application Jul. 31, 1992, Ser. No. 923,320
Int. Cl.[5] B24C *3/00*
U.S. Cl. 51—410 15 Claims



1. A unitary, portable, self-powered tool for ejecting a stream of granular particulate materials toward a target site comprising:

a portable propellant container, enclosing compressed propellant liquid, with a sealable top opening,

a hollow hopper, with a storage chamber accommodating a supply of granular particles, connected to and supported by the container,

a sealing nozzle cap connected to the container and sealing its top opening,

means forming a vent connecting ambient atmosphere to the inside of the hopper chamber,

a pressure valve between the container and the nozzle cap for releasing the propellant as compressed gas,

a trigger extending outward from the nozzle cap connected to actuate the pressure valve,

a nozzle protruding from the nozzle cap,

means forming a mixing chamber in the nozzle cap positioned above the uppermost level of the supply of granular particles in the hopper and connecting the pressure valve to the nozzle,

a delivery conduit connecting a lower end of the hopper chamber to the mixing chamber,

and means forming a reduced diameter orifice in the nozzle cap between the pressure valve and the mixing chamber, positioned to produce enhanced negative pressure promoting aspiration of particles from the hopper chamber through the delivery conduit to the mixing chamber,

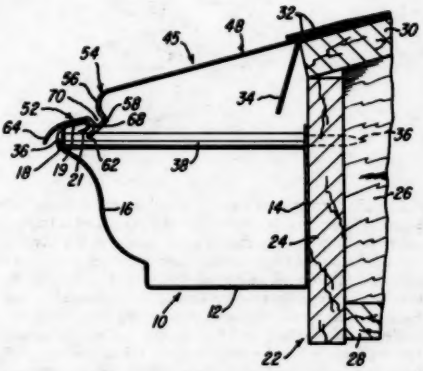
all of said components being combined for use in a symmetrically balanced unitary portable assembly which can be seized, carried, aimed and operated by the user in only one hand to eject the granular particles.

5,181,350

LEAF DEFLECTING COVER DEVICE FOR A RAIN GUTTER

Alan F. Meckstroth, 2310 Far Hills Building, Dayton, Ohio 45419-1575

Filed Dec. 23, 1991, Ser. No. 811,863
Int. Cl.[5] E04D *13/00*
U.S. Cl. 52—12 9 Claims



1. For use in combination with an elongated trough-like rain gutter having an open top and including an outer front wall with an upper edge portion and an inner rear wall attached to a facia board of a building, a device for deflecting leaves and other debris over said gutter and for directing water draining from a roof covering into said gutter, said device comprising an elongated cover strip including a longitudinally extending generally flat inner portion adapted to project under a roof covering, said generally flat inner portion continuing outwardly to cover a substantial portion of said gutter and to direct substantially all of the water received from the roof covering over said substantial portion of said gutter, said strip also including a longitudinally extending outer portion positioned to seat on said upper edge portion of said front wall of said gutter, said outer portion of said strip extending outwardly from said upper edge portion of said gutter and including a downwardly projecting lip portion, said strip further including a longitudinally extending intermediate portion connecting said inner and outer portions of said strip, said intermediate portion including a longitudinally extending rounded nose portion disposed above a longitudinally extending U-shaped channel portion projecting downwardly into said gutter adjacent said upper edge portion of said gutter, said rounded nose portion located inwardly of said upper edge portion of said front wall for directing the water received from said inner portion of said strip downwardly into said channel portion and for deflecting leaves and other debris outwardly onto said outer portion of said strip means defining longitudinally spaced openings within said channel portion for directing water received within said channel portion into said gutter, and said lip portion spaced outwardly from said front wall of said gutter for directing leaves and other debris away from said front wall of said gutter to avoid the accumulation of dirt on said front wall of said gutter.

5,181,351

BUILDING ELEMENT FOR SUPPOTING GRID WALLS WITH A BULK MATERIAL FILLING

Felix P. Jaecklin, Geissbergstrasse 46, CH-5400 Ennetbaden, Switzerland

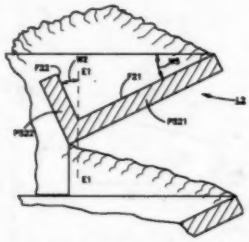
Division of Ser. No. 24,846, Mar. 18, 1987, Pat. No. 5,017,050, which is a continuation of Ser. No. 721,858, Apr. 9, 1985, abandoned. This application May 14, 1991, Ser. No. 699,882

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1984, 3413479

The portion of the term of this patent subsequent to May 21, 2008, has been disclaimed.

Int. Cl.[5] E04C *1/39;* **E02D** *17/02, 29/02;* **C10J** *3/02*

U.S. Cl. 52—35 **13 Claims**



1. A supporting grid wall for a bulk material filling defining a generally vertically extending wall plane and a frame plane extending transversely thereto, comprising at least two beams arranged at an angle to one another and connected in a form-locking or material-locking manner, one of said beams being a longitudinal beam extending substantially parallel to the wall plane and comprising at least two profile legs arranged at an angle to one another, said first profile leg having at least one bearing surface for the bulk material filling covering substantially the central part of the longitudinal beam's cross-section, and said second profile leg having a retaining surface for the bulk material filling facing the inside space of the frame, offset to and disposed at an angle to the outside of the frame with respect to the bearing surface for the bulk material filling, characterized in that said first profile leg has a wedge-shaped cross-section with a cross-sectional height which increases evenly from the outside inwards.

5,181,352

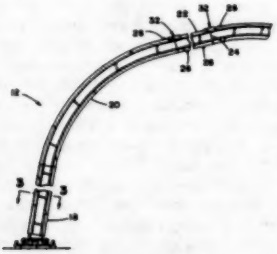
RAIN CAP SYSTEM FOR FAST MODULAR STRUCTURES

Michael Friedman, 528 Winston Ave., Bradbury, Calif. 91010

Filed Feb. 21, 1991, Ser. No. 659,026

Int. Cl.[5] E04B *1/32;* **E04H** *15/42*

U.S. Cl. 52—58 **5 Claims**



1. An apparatus for preventing weather elements from penetrating the assembly junctions of a temporary building structure, comprising an arched frame comprised of I beam segments joined end to end, wherein each I-beam segment is formed with a top, a pair of outer walls, and a bottom, the outer walls each having a longitudinally extending, outwardly opening rounded slot therein, and a rain cap conformably disposed on and covering the joined end-to-end I beam segments of the arched frame, the rain cap consisting essentially of a planar first portion spanning the top of the joined I-beam segments for face to face engagement therewith and a pair of planar side flanges integrally formed with the planar first portion and extending downwardly and perpendicular from the planar first portion for face to face engagement with the respective outer walls of the joined I-beam segments, each planar side flange extending to a distance just above the rounded slot in the respective outer walls of the joined I-beam segments, each planar side flange being terminated in a lip turned inwardly therefrom to engage an edge of the rounded slot in the outer walls of the joined I-beam segments, the rain cap extending along a longitudinal length of the arched frame for a distance less than a total length of the arched frame sufficient to cover the joined ends of the I-beam segments.

5,181,353

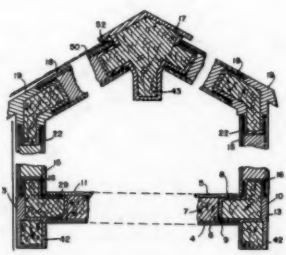
FOAM SANDWICH ENCLOSURE WITH INTERLOCKING INTEGRAL FRAME

James T. Harrington, Jr., 9500 NW. 27th Ave., Miami, Fla. 33147

Filed Nov. 4, 1991, Ser. No. 787,529

Int. Cl.[5] E04C *2/46;* **E04B** *1/343*

U.S. Cl. 52—79.1 **6 Claims**



1. An insulated building structure comprising:

A) at least one bottom horizontal foam sandwich panel;

B) at least one top horizontal foam sandwich panel;

C) a plurality of vertical wall foam sandwich panels joining together said top and bottom foam sandwich panels and joined to one another to form an enclosure within said panels;

D) each of said foam sandwich panels having a rigid closed-cell foam core with two broad, flat faces, said core sandwiched between, and bonded to, a first broad flat outer face sheet on a first face and a second broad flat inner face sheet on a second face, each said face sheet having a high tensile strength much greater than that of said core, having a thickness less than half that of said core, and extending beyond the edges of said core to define grooves along each edge of said panel;

E) integral, interlocking frame means rigidly joining together said panels along said edges, said frame means including:

a) a plurality of elongate, foam-core edge connectors, each edge connector comprising: an inner space filled with a rigid foam center enclosed by a tubular, high tensile strength outer layer having a thickness less than that of said inner space, said edge connector having a uniform cross sectional profile for manufacture by extrusion; said outer layer defining a central body portion and a plurality of tongues extending from said central body at fixed angles to one another to correspond to the angle between adjoining panels; each said tongue arranged to fit snugly within the groove at the edge of a

panel, and having a flat first bonding surface bonded to the inner surface of the first face sheet of said panel and a flat second bonding surface bonded to the inner surface of the second face sheet of said panel within said groove and a third bonding surface connecting said first and second bonding surfaces bonded to said foam core within said groove, said first and second bonding surfaces being substantially parallel to one another and perpendicular to said third bonding surface, said first and second bonding surfaces being spaced apart by said inner space a distance substantially equal to the thickness of said core of said panel said connectors having a cross section with a foam inner space completely encircled by said high tensile strength outer layer;

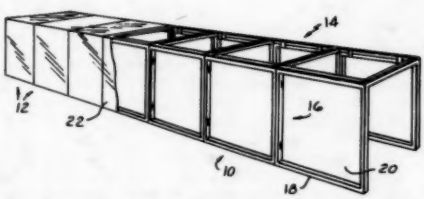
b) a plurality of end joining means rigidly connecting together the ends of adjacent edge connectors, each said joining means including a main body; a plurality of inner members projecting outwardly from said main body at angles to one another corresponding to the angles between adjacent edge connectors, each inner member fitting snugly within the inner space at the end of said edge connector, said inner space being devoid of foam to receive said inner member telescopically therein with bonding means fixedly bonding said inner member to the inner wall of said outer layer of said edge connector to thereby form an integral bonded frame interlocked and bonded to said panels with high tensile layers spaced apart by rigid foam.

5,181,354

BARRIER PANEL

Robert A. Krueger, and Michael K. Krueger, both of Shelby Township, Macomb County, Mich., assignors to Tri-Mark Metal Corporation, Detroit, Mich.

Filed Mar. 5, 1991, Ser. No. 664,811
Int. Cl.[5] E04H *9/16*
U.S. Cl. 52—79.1 **15 Claims**



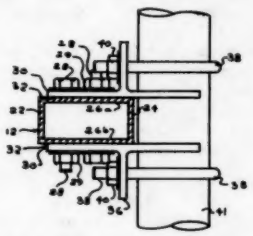
1. A barrier panel comprising: a self-supporting rigid framework with frame members encompassing at least one through opening, said frame members are hollow tubes with a closed cell generally rectangular cross section with an outer peripheral surface completely enclosing an inner surface, at least one pair of retainer and clip clamping members which are complementary, axially elongate, substantially encompass the through opening and can be releasably assembled with a cover sheet between them, one of the retainer and clip members being located on the exterior of the frame members and a side face of the framework, in cross section the periphery of said retainer being generally circular, said clip member being of plastic and somewhat resilient and in cross section having a generally C-shape with side edges spaced apart and terminating at a distance less than the outside diameter of said retainer member; and a cover sheet of a flexible material over the through opening and releasably secured to the framework by being received between the retainer and clip members.

5,181,355

FRAME SUPPORT FOR PANELED SCREENS AND LIKE STRUCTURES

Leonard P. Skolnick, Chatham, and Joseph D. Clinton, West Chester, both of Pa., assignors to 3-D Structures, Inc., Avondale, Pa.

Division of Ser. No. 597,113, Oct. 12, 1990, Pat. No. 5,097,640.
This application Nov. 25, 1991, Ser. No. 797,547
Int. Cl.[5] E04B *1/32*
U.S. Cl. 52—80 **12 Claims**



1. A support frame for supporting a surface generally conforming to the frame comprising:

a plurality of first elongated rounded cross section structural members arranged generally parallel to one another;

at least one second elongated polygonal cross section structural member arranged transverse to the first structural members having at least a pair of parallel faces;

a pair of separate bracket members having at least a pair of planar surfaces for application to opposed parallel faces of the polygonal cross section member, each having a rounded groove at one edge generally conforming to the rounded cross section structural member;

means to hold the bracket members to the planar surfaces and to one another so that the rounded grooves are aligned; and

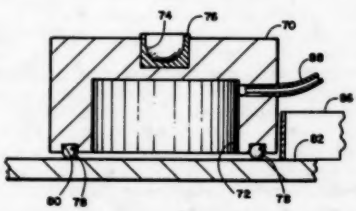
clamp members cooperating with the bracket members to engage the rounded cross section member to hold the rounded member in the grooves.

5,181,356

EARTHQUAKE RESISTANT BUILDING SUPPORT SYSTEM

Tae H. Sul, 12232 Central St., Lakewood, Calif. 90715

Division of Ser. No. 692,665, Apr. 29, 1991, Pat. No. 5,103,605.
This application Jan. 6, 1992, Ser. No. 804,009
Int. Cl.[5] E04B *1/98*
U.S. Cl. 52—167 DF **4 Claims**



1. An earthquake resistant building support system which comprises:

a base means adapted to be secured to the earth below a building;

a substantially horizontal planar upper surface on said base means;

an upstanding wall surrounding said base means;

building support means adapted for connection to and sup-

port of at least a portion of a building, said support means comprises a body having a cavity therein extending to one end surface with an opening at said one end surface, said one end surface being positioned adjacent to said planar upper surface of said base means;

a groove surrounding said cavity in said one end surface;

an O-ring of elastic compressible material secured in said groove;

means for introducing gas under pressure into said cavity, said gas under pressure contained within said cavity by said O-ring and means at the end of said body opposite said opening of said cavity for attachment to a building to be supported;

said support means adapted to rest on said base upper surface for sliding movement relative thereto;

spring means along said base wall and normally spaced from said building support means to absorb energy and prevent direct impact in the event that said relative sliding movement brings said wall and support means together.

5,181,357

PROFILED, STRIP PARTICULARLY ADAPTED TO COMPENSATE THE RELATIVE DISPLACEMENTS OF A FLOOR COVERING WITH RESPECT TO AN ADJACENT WALL AND PROCESS FOR MANUFACTURING SUCH A PROFILED STRIP

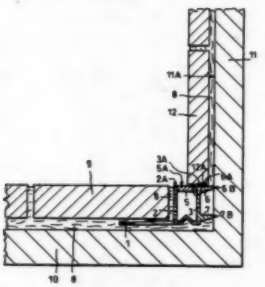
Jean-Jacques Pourtau, and Thierry E. Pourtau, both of Croissy sur Seine, France, assignors to Tomecanic, France

Filed Mar. 22, 1991, Ser. No. 673,598

Claims priority, application France, Mar. 30, 1990, 90 04117

Int. Cl.[5] E04F *15/00, 19/02*

U.S. Cl. 52—179 **21 Claims**



1. A profiled corner strip for interconnecting a wall covering and a floor covering disposed at substantially a 90 degree angle, said profiled corner strip comprising:

a) an elongate sole plate including a lower surface, an upper surface, and a longitudinal edge;

b) a first support limb formed in and extending perpendicular to the upper surface of said sole plate along an edge of said sole plate opposite the longitudinal edge, said first support limb having an outer surface for bonding said first support limb to an edge of a floor covering;

c) a second support limb connected to said first support member in parallel, spaced-apart relationship;

d) spacer means extending from an outer surface of said second support limb for engaging a wall;

e) bridge means positioned between said first support limb and said second support limb such that an outer edge of said first support limb, an outer surface of said bridge means, an outer edge of said second support limb, and an outer surface of said spacer means form a planar surface to slidingly support a wall covering mounted on the wall whereby said bridge means compensates for the relative displacement of the floor covering to maintain a joint between the floor covering and the wall covering.

5,181,358

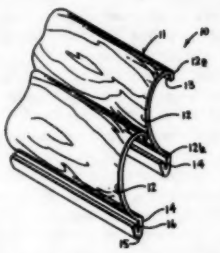
SIMULATION LOG SIDING APPARATUS

Gerald R. Mead, P.O. Box 394, Teague, Tex. 75860

Filed Oct. 28, 1991, Ser. No. 783,521

Int. Cl.[5] E04B *1/10*; E04C *3/00, 3/30*; B44F *7/00*

U.S. Cl. 52—233 **1 Claim**



1. A simulation log siding apparatus for mounting to a structural vertical wall surface, wherein the apparatus comprises,

at least a plurality of longitudinal members arranged in a parallel interlocking edge-to-edge relationshp, including an upper longitudinal member and a lower longitudinal member, the upper longitudinal member and the lower longitudinal member each including an arcuate convex semi-cylindrical wall portion defining a longitudinal member cavity, wherein the semi-cylindrical wall portion includes an upper end and a lower end, the upper end including an upper planar flange, and the lower end including a lower flange, wherein the upper planar flange and the lower flange are coplanar and are diametrically aligned relative to the semi-cylindrical wall, and

the lower flange including a lower flange plate mounted to a lower edge of the lower flange plate coextensive therewith to define a "V" shaped trough between the lower flange and the lower flange plate, wherein the upper planar flange of the lower longitudinal member is received within the "V" shaped trough of the upper longitudinal member, and

a starter strip for securement to the wall surface, wherein the starter strip includes a rear starter plate mounted coextensively to a forward starter plate defining a receiving trough, and a plurality of spaced rear openings directed through the rear starter plate and a plurality of forward openings directed through the forward starter plate are aligned relative to one another for reception of fastener structure therethrough, wherein the upper planar flange of the upper longitudinal member is received within the receiving trough, and

the lower flange and the lower flange plate are secured together at a lower flange junction, wherein a plurality of apertured securement flanges are fixedly mounted to the lower flange junction, wherein the securement flanges are coplanar with the lower flange and the upper planar flange, and

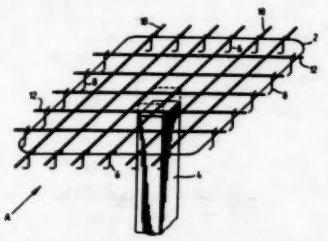
each arcuate convex semi-cylindrical wall includes a threaded bore directed therethrough, and each threaded bore includes a connector member, the connector member including an externally threaded conduit tube threadedly directed into the threaded bore, with the externally threaded conduit tube including a tube projection conduit coaxially aligned with the externally threaded conduit tube, wherein an abutment head formed at an upper terminal end of the externally threaded conduit tube limits projection of the externally threaded conduit tube within the threaded bore, and pesticide conduit is secured to the tube projection and the pesticide conduit in fluid commu-

nication with a pressurized pesticide reservoir to direct pesticide through the connector member into the longitudinal member cavity of each longitudinal member.

5,181,359
SHEARHEAD REINFORCEMENT

Palvinder Chana, Langley, and John D. Clapson, Eastleigh, both of England, assignors to Square Grip Limited, United Kingdom

Division of Ser. No. 602,102, Oct. 22, 1990, Pat. No. 5,090,172. This application Nov. 25, 1991, Ser. No. 797,385
Int. Cl.[5] E04B *1/16*
U.S. Cl. 52—253 **7 Claims**

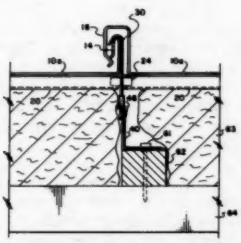


1. A shearhead assembly supporting a laterally extending concrete slab on a column wherein a shearhead is cast within the slab around the column, the shearhead comprising a hoop bar for extending around the column with a plurality of shear legs attached thereto and depending therefrom, each shear leg including a portion extending above the hoop bar, which portion forms a hook for coupling to reinforcement in the slab.

5,181,360
STANDING-SEAM ROOF PANEL SYSTEM

Thomas M. Shingler, Garland, Tex., assignor to United Dominion Industries, Inc., Charlotte, N.C.

Filed Sep. 13, 1991, Ser. No. 759,532
Int. Cl.[5] E04D *1/00, 1/34;* E04B *1/34*
U.S. Cl. 52—520 **7 Claims**



1. A standing-seam roof system supported by at least two spaced-apart transverse roof purlins, comprising:

multiple standing-seam roof panels each having an essentially flat central portion and two upstanding side legs profiled into a pair of compatible, interlocking male and female-profiled portions, said roof panels being assembled in a side-by-side fashion with a series of mechanically interlocked seams;

a layer of thermal-insulating blanket being sandwiched between said roof panels and said roof purlins;

said roof panels being secured by concealed clip assemblies engaged with said panels at said seams, said clip assemblies being fastened to said roof purlins and comprising a top clip portion and a base clip portion means for vertically adjusting the clip relative to the baseclip;

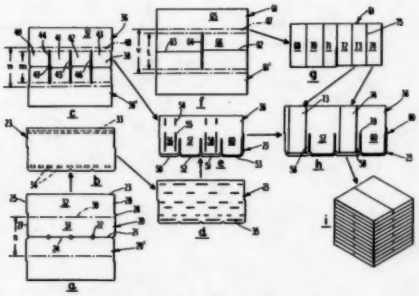
hold-down means for engaging said seam, said hold-down means being with said top clip; and

means for interlocking said top clip portion and said base clip portion, such that said roof panels are installed without substantial compression of said thermal-insulating blanket.

5,181,361
MULTI-LAYER SHINGLE

Marcia G. Hannah, Wayne; George W. Mehrer, Jenkintown; Michael J. Noone, Wayne; Kermit E. Stahl, North Wales, and Joseph Quaranta, Yardley, all of Pa., assignors to CertainTeed Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 110,801, Oct. 20, 1987, Pat. No. Des. 314,628, which is a continuation-in-part of Ser. No. 174,023, Mar. 28, 1988. This application Apr. 27, 1990, Ser. No. 515,601
Int. Cl.[5] E04D *1/00*
U.S. Cl. 52—535 **24 Claims**



1. A multi-layer laminated shingle comprising:

(a) a base layer having a butt portion and a tab portion;

(b) a secondary layer having a butt portion and a tab portion and having said butt portion and tab portion substantially overlying said butt and tab portions respectively of said base layer, with a plurality of substantially spaced-apart slots in the tab portion defining spaced shingle tabs of predetermined widths; and

(c) with at least one shingle strip portion comprising a top shingle layer applied and covering at least a portion of at least one tab of said secondary shingle layer;

said shingle layers each comprising a bituminous coated web between top and bottom surface portions having granules applied to top surface portions thereof; and means laminating said layers together with granules sandwiched between said laminated layers.

5,181,362
INTERLOCKING BUILDING BLOCKS

Rafael C. Benitez, 390 NW. 2nd St., Apt. 806, Miami, Fla. 33128

Filed Sep. 16, 1991, Ser. No. 760,575
Int. Cl.[5] E04C *1/00*
U.S. Cl. 52—594 **9 Claims**

1. An interlocking building block system comprising:

a plurality of rigid, sturdy blocks including at least one standard block, at least one squared corner block, and at least two angled corner units,

each of said blocks including a top surface, a bottom surface, and four outer faces including a front face, a rear face, a left face, and a right face, and at least one transverse bore passing through said top surface and said bottom surface,

said bottom surface including at least one elongate, rounded, cutout channel,

said top surface including at least one elongate, rounded, protruding ridge structured and disposed to be correspondingly positioned in engaging, securing relation

within said elongate, rounded, cutout channel in an adjacently stacked one of said blocks,

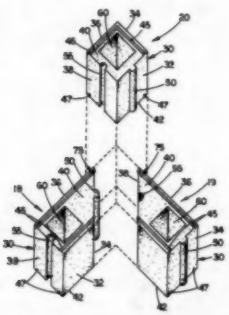
said outer faces further including at least one rounded, vertical, cutout channel extending from said top surface to said bottom surface and positioned in said left face in a substantially centered position between said front face and said rear face,

said outer faces also including at least one rounded, vertical, protruding ridge extending from said top surface to said bottom surface and being structured and disposed to be correspondingly fitted, in engaging, securing position within said rounded, vertical, cutout channel of an adjacently positioned one of said blocks,

said standard block and said angled corner units including said rounded, vertical, protruding ridge positioned on said right face in a substantially centered position between said front face and said rear face,

said top surface of said standard block and said angled corner units including two of said elongate, rounded, protruding ridges extending from said left face to said right face, each of said elongate, rounded, protruding ridges being on opposite sides of said transverse bore,

said bottom surface of said standard block and said angled corner units including two of said elongate, rounded, cutout channels extending from said left face to said right face, each of said elongate, rounded, cutout channels being on opposite sides of said transverse bore,



said front face of at least one of said standard blocks including a rounded, protruding ridge, extending from said top surface to said bottom surface in substantially centered relation between said left face and said right face, said ridge being adapted to be fitted within the vertical rounded, channel of a perpendicularly positioned one of said blocks,

said angled corner units including a first angled corner unit and a second angled corner unit for use in the formation of a 90° squared corner,

said right face of said first angled corner unit being angled so as to form a generally 45° angle with said rear face, and said left face of said first angled corner unit being generally perpendicular to said front face and said rear face,

said left face of said second angled corner unit being angled so as to form a generally 45° angle with said rear face, and said right face of said second angled corner unit being generally perpendicular to said front face and said rear face, said left face of said second angled corner unit being structured and disposed to be fitted with said right face of said first angled corner unit so as to form said 90° squared corner,

said squared corner unit being generally square, and said rounded, vertical, protruding ridge being positioned on said front face in a substantially centered position between said left face and said right face,

said squared corner unit including two of said rounded protruding ridges along said top surface thereof, said ridges being perpendicularly positioned along a length defined by said rear face and a length defined by said right face, thereby allowing the facilitated positioning of said angled corner units thereon, and

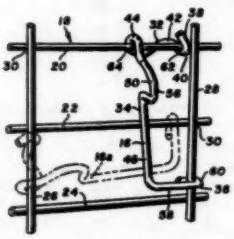
said squared corner unit including two of said rounded cutout channels along said bottom surface thereof, said channels being perpendicularly positioned along said length defined by said rear face and said length defined by said right face, thereby allowing said squared corner block to be securely placed atop said angled corner units.

5,181,363

SPACER FOR CONCRETE REINFORCING FABRIC

Christopher B. Leach, deceased, late of Lowell, Mich. by Audrey Leach, personal representative , and John L. Kaines, Ludington, Mich., assignors to Cam Sales, Inc., Ludington, Mich.

Division of Ser. No. 173,107, Mar. 28, 1988, Pat. No. 4,920,724.
This application Apr. 30, 1990, Ser. No. 516,429
The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.
Int. Cl.[5] E04C *5/16*
U.S. Cl. 52—685 **11 Claims**



1. An apparatus suited for removable attachment to a concrete reinforcing framework, said framework including a plurality of parallel and spaced apart longitudinally directed first frame members and a plurality of parallel, spaced apart and generally transverse second frame members, said frame members connected to one another at a plurality of junctions, said apparatus including:

a unitary spacing member constructed of a flexible material and having a mounting section positionable in surrounding relation about a selected one of said first frame members, with a first end portion of said mounting section positioned against a selected one of said second frame members on one side of the junction, the entire mounting section being positioned on the same side of the junction, such that the mounting section can slide toward the junction until the first end portion thereof engages the second frame member at the junction;

an intermediate section at least one twice as long as said mounting section, said intermediate section extending from an inner end, which is connected to a second and opposite end portion of said mounting section, to an outer end, the intermediate section and mounting section defining a reference plane, said intermediate section including a spacing means directed generally normal to said reference plane with an apex positioned a predetermined distance from the reference plane; and

a latching means at the outer end of said intermediate section for forming a latching engagement with said selected second frame member, the latching means terminating at a position short of the second frame member when the spacer is in an undeflected position, the latching means engaging and latching the outer end of the intermediate section on the second frame member when the spacing member is resiliently deflected toward the second frame member, the engagement of the first end portion of the mounting section with the second frame member restraining the spacing member from sliding laterally toward the

second frame member when the spacing member is urged toward the second frame member, the mounting section resisting compression while at the same time restraining the intermediate section from pivotal movement toward the second frame member without resilient bending and deflecting, the engaged latching means in combination with the engagement of the first end of the mounting section with the second frame member holding the spacing member in a resiliently deflected position, the residual force of the resilient deflection tending to maintain the latching engagement and secure the spacing member on the framework.

5,181,364

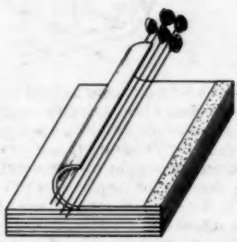
WRAPPING A FLORAL GROUPING WITH SHEETS HAVING ADHESIVE OR COHESIVE MATERIAL APPLIED THERETO

Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application Jun. 2, 1992, Ser. No. 893,586

Int. Cl.[5] B65B *51/02, 61/06*

U.S. Cl. 53—397 **17 Claims**



1. A method for wrapping an item, comprising:

providing a pad comprising a plurality of sheets of material having a top sheet of material with the other sheets of material being disposed under the top sheet of material, each sheet of material having a first side and a second side, a first end and a second end, an upper surface and a lower surface, each sheet of material having a pressure sensitive adhesive on the upper surface of the sheet of material;

providing a floral grouping having an upper end and a stem end, the floral grouping comprising the item;

placing the floral grouping on the top sheet of material; and

wrapping the top sheet of material about the floral grouping and disconnecting the top sheet of material from the pad of sheets of material, the first side of the sheet of material overlapping portions of the sheet of material and bonding the overlapping portions of the sheet of material by contacting the pressure sensitive adhesive on the upper surface with adjacent overlapping portions of the sheet of material whereby the first side of the sheet of material has bonded to overlapping portions of the sheet of material generally between the first and the second ends of the sheet of material and with the sheet of material substantially encompassing and surrounding a substantial portion of the stem end of the floral grouping and being held about the floral grouping by the bonding of the overlapping portions of the sheet of material, the sheet of material wrapped about the floral grouping wrapping having an opening extending through the lower end thereof and an opening extending through the upper end thereof with the stem end of the floral grouping extending through the opening in the lower end and the flower end of the floral grouping being exposed near the opening in the upper end thereof.

5,181,365

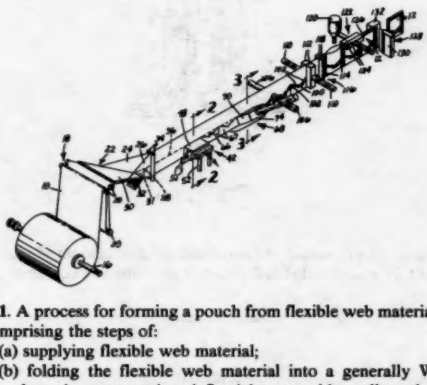
METHOD AND APPARATUS FOR FORMING INDIVIDUAL POUCHES FROM A CONTINUOUS WEB AND PACKAGING A PRODUCT IN THE INDIVIDUAL POUCHES

Joseph F. Garvey, Oakdale; Aaron A. Minion, Minneapolis, and Warren T. Smith, Minnetrista, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 9, 1991, Ser. No. 804,357

Int. Cl.[5] B65B *9/08*

U.S. Cl. 53—455 **44 Claims**



1. A process for forming a pouch from flexible web material comprising the steps of:

(a) supplying flexible web material;

(b) folding the flexible web material into a generally W shape in cross-section defined by two side walls and a bottom gusset, the bottom gusset divided by a fold line into gusset portions which lie adjacent to lower side wall portions of the side walls;

(c) performing a forming operation by relatively modifying the relationship between the gusset portion and lower side wall portion of one of the gusset portion and lower side wall portion combinations of the folded flexible web material without performing said forming operation on the other gusset portion and lower side wall portion combination at the same time; and

(d) forming a plurality of transverse seals dividing the folded flexible web material into at least one pouch.

5,181,366

CRIMPER-PROPELLANT FILL HEAD

Rodney P. Smith, and Gregory C. Vens, both of Moline, Ill., assignors to The Kartridg Pak Co., Davenport, Iowa

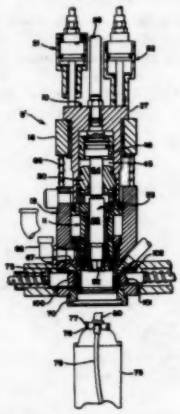
Filed Nov. 5, 1991, Ser. No. 788,096

Int. Cl.[5] B65B *3/04, 31/04*

U.S. Cl. 53—470 **6 Claims**

1. In the undercap method of introducing propellant into an aerosol container containing a product to be dispensed by propellant pressure in spray or aerosol form through the external valve assembled to the closure cap sealed to the container, wherein, a bell is brought into temporary hermetic sealing relationship with the container so as to form a sealed bell chamber over the mouth of the container and including the closure cap resting on the container mouth and the external valve assembled thereto, a charge of propellant in the liquid state is introduced into the bell chamber and flows under the closure cap into the container leaving a residual amount of propellant in the sealed bell chamber, the closure cap is crimped in sealed relationship onto the container leaving said residual amount of propellant trapped in the bell chamber, and the bell and container are separated, the improvement which

comprises, injecting compressed gas into said sealed bell chamber after said charge of propellant has been introduced thereby



purging a substantial portion of said residual amount of propellant from said sealed bell chamber and into said container.

5,181,367

METHOD AND APPARATUS FOR INSERTING SLIDE FRAMES OR FILM STRIPS INTO THE POCKETS OF A FILM JACKET

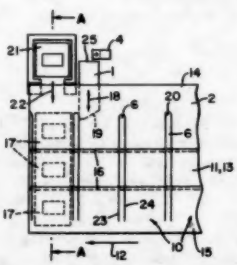
Gottfried Stemmer, Garmisch-Partenkirchen, Fed. Rep. of Germany, assignor to Geimuplast Peter Mundt GmbH & Co. KG, Farchant, Fed. Rep. of Germany

Filed Oct. 3, 1991, Ser. No. 770,574

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1990, 4030198; Feb. 8, 1991, 4103910

Int. Cl.[5] B65B *41/18, 57/06, 5/04*

U.S. Cl. 53—473 **13 Claims**



1. Method of inserting slide frames **(17, 21)** or film strips **(31)** into pockets **(10)** of a two-layer film jacket **(2)** open on one side **(14)**, wherein the pockets **(10)** are partitioned from each other by transverse seams **(6)**, comprising successively inserting,

one or several slide frames **(17, 21)** or film strips into a pocket **(10)**, and transporting

the film jacket **(2)** in the longitudinal direction **(12)** of the film to the next pocket **(10)** to be filled, the improvement comprising detecting the position of the next transverse seam during the transport of the film jacket **(2)** for the positioning of the next pocket **(10)** to be filled wherein the detecting of the position of the next transverse seam **(6)** is by a feeler **(1)**.

5,181,368

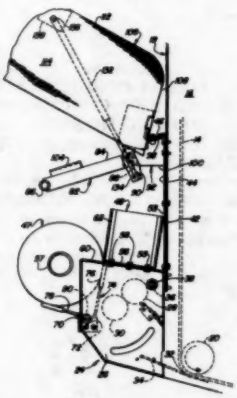
HOUSING FOR HOLDING A SUPPLY ROLL OF LARGE ROUND BALE WRAP MATERIAL

Henry D. Anstey; William A. Ardueser, both of Ottumwa, and George W. Rumph, Bloomfield, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 17, 1991, Ser. No. 809,002

Int. Cl.[5] B65B *11/04*

U.S. Cl. 53—587 **37 Claims**



1. In a large round baler including support structure adjacent a bale-forming chamber, a bale wrapping mechanism mounted to the support structure and including a wrap material supply roll housing having an upwardly facing wrap material roll support surface and an upright roll abutment surface facing away from the chamber for supporting a roll of bale surface wrap material in a dispensing zone adjacent the chamber, a cover including at least top, opposite side and rear walls joined together and being pivotally connected to the support structure for movement about a horizontal transverse axis between a raised open position wherein it is elevated above the dispensing zone and a lowered closed position wherein it encloses the dispensing zone, and at least one spring member acting between the cover and the structure for biasing the cover to resist movement of the cover toward its closed position when the cover is in its open position, the improvement comprising: said wrapping mechanism further including a brake member having a transverse bar mounted for pivotal movement about a second horizontal transverse axis between a working path located within said dispensing zone wherein it contacts a roll of wrap material located in said zone and a raised inoperative position elevated above said dispensing zone; said at least one spring member being connected between the cover and said brake member such that the spring member biases the bar toward an extreme downward position within said dispensing zone when the cover is in its closed position and biases the bar to its inoperative position when the cover is in its open position.

5,181,369

BATTERY POWERED LINE TRIMMER

Robert G. Everts, Chandler, Ariz., assignor to Inertia Dynamics Corporation, Chandler, Ariz.

Continuation of Ser. No. 663,447, Mar. 1, 1991. This application Nov. 26, 1991, Ser. No. 799,902

Int. Cl.[5] B26B *7/00*; **A01D** *35/00*

U.S. Cl. 56—12.7 **8 Claims**

1. A battery powered line trimmer for cutting vegetation, the trimmer comprising:

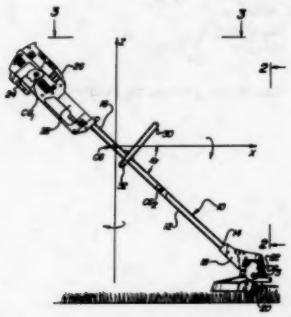
an elongated shaft having a forward end and a rearward end;

an electric motor having an output member for rotating a cutting line, the electric motor affixed to the forward end

of the elongated shaft and aligned relative thereto so that the output member extends downwardly and has a generally vertical axis of rotation when the trimmer is oriented in an operative position, wherein the elongated shaft inclines rearwardly from the electric motor and the cutting line rotates in a plane generally parallel to the ground;

a battery pack affixed to the rearward end of the elongated shaft;

a front handle cooperative with the elongated shaft having a grip for one hand of an operator located rearward of the electric motor and forward of the center of gravity of the trimmer in the operative position; and



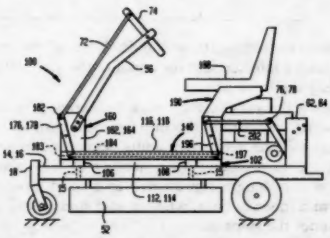
a rear handle cooperative with the elongated shaft having a grip for the other hand of the operator located forward of the battery pack and rearward of the center of gravity of the trimmer in the operative position, wherein the front and rear handles are located above the center of gravity of the trimmer in the operative position, and the electric motor and battery pack spaced apart locations result in a relatively high moment of inertia about a vertical axis extending through the center of gravity so that the trimmer remains relatively stable in the hands of the operator when the cutting line strikes an object imposing a reaction torque on the trimmer.

5,181,370

CUTTING DECK-MOUNTED AUXILIARY OPERATOR CONTROL HANDLE TRANSFORMER UNIT AND METHOD FOR CONVERTING WALK BEHIND MID-SIZE ROTARY MOWER INTO RIDING MOWER

Nicholas Simone, 2225 Highway AlA, Unit 604, Indian Harbour Beach, Fla. 32937

Filed Apr. 5, 1991, Ser. No. 680,926
Int. Cl.[5] A01D *34/64*
U.S. Cl. 56—14.7 **27 Claims**



21. A method of converting a mid-size, walk or ride-behind rotary mower into a riding mower configuration, such that a mower operator is able to control the operation of the mower from atop its cutting deck, said mower having a front end supported by way of a pair of support wheels and a rear end supported by a pair of drive wheels, said drive wheels being coupled to a drive unit mounted at the rear end of said mower, the mower's cutting deck being supported between front and rear ends thereof, and an operator control handle having one or more control elements, which are coupled through linkage to said drive unit and through manipulation of which the operation of said mower is controlled, said operator control handle being mounted to a control handle attachment fixture at the rear end of said mower, such that the operator control handle normally extends rearwardly of said rear end of said mower, so as to be operated, in its normal walk or ride-behind mode, by said mower operator from behind the rear end of said mower, comprising the steps of:

(a) providing a support frame having an auxiliary operator control handle attachment fixture mounted thereto, said auxiliary operator control handle attachment fixture being configured to engage and support said operator control handle such that said operator control handle, when repositioned by attachment to said auxiliary operator control handle attachment fixture, extends rearwardly of said auxiliary operator control handle attachment fixture, said support frame further including an auxiliary control linkage arrangement operative to link one or more control elements of said repositioned operator control handle with the drive unit of said mower;

(b) mounting said support frame atop the cutting deck of said mower, and repositioning said operator control handle by attaching said operator control handle to said auxiliary operator control handle attachment fixture such that the repositioned operator control handle expands rearwardly of said auxiliary operator control handle attachment fixture to a position above said cutting deck adjacent to where an operator is to be situated; and

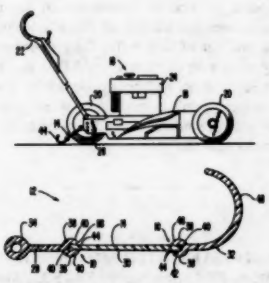
(c) providing an operative communication between the one or more control elements of said auxiliary control linkage arrangement with the drive unit of said mower.

5,181,371

FLEXIBLE JOINT ASSEMBLY FOR PARTITION ASSEMBLAGE

Sam DeWorth, Pickerington, Ohio, assignor to Crane Plastics Company, Columbus, Ohio

Filed Aug. 5, 1991, Ser. No. 740,425
Int. Cl.[5] A01D *75/20*
U.S. Cl. 56—17.4 **18 Claims**



1. A joint assembly comprising discrete members which are flexibly joined together and wherein:

one of said discrete members includes receiving means made of a rigid and heat bondable material and formed on at least one marginal edge portion of said one discrete member; and,

another of said discrete members including a resiliently flexible portion longitudinally extending along a marginal edge thereof and protruding therefrom, said protruding flexible portion being in interfitting heat bonded engagement with said rigid receiving means, said rigid receiving means interfacing with and encompassing a substantial

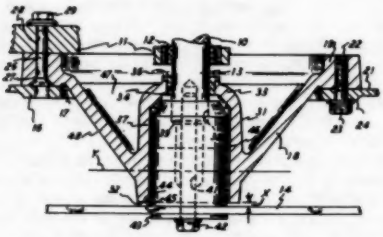
area of said protruding portion such that the joint assembly resists separation thereof when subjected to torsional and bending forces.

5,181,372

SUPPORT FOR MOUNTING AN IMPLEMENT ENGINE AND SUPPORTING ITS CRANKSHAFT

James S. Hayek, Racine, Wis., assignor to Textron Inc., Providence, R.I.

Filed Jul. 16, 1991, Ser. No. 731,861
Int. Cl.[5] A01D *75/18*
U.S. Cl. 56—17.4 **15 Claims**



13. A support for mounting an implement engine and supporting its crankshaft which has an extending end, comprising an implement having a deck with an opening therein, an adaptor connected to the crankshaft extending end and being concentric therewith and rotatable therewith, a cage having a cylindrical portion surrounding and being available to rotationally support said adaptor and being insertable through said opening, a flange included in said cage and having a first surface for resting on said deck and having a second surface for upwardly supporting said engine, the said two surfaces being parallel to each other and respectively defining lower and upper extents of said flange, said flange having a first set and a second set of mounting holes extending through said surfaces and with said two sets being axially offset with respect to each other, threaded fasteners extending in said first set of said holes for respectively attaching said engine on said flange in contact with said second surface to constitute an assembly of said engine and said cage, and additional threaded fasteners extending in said second set of said holes for respectively attaching said assembly onto said deck with said first surface upwardly supported on said deck, and frusto-conically shaped portion included in said cage and extending upwardly and outwardly relative to the axis of said crankshaft and from said cage cylindrical portion to said flange.

5,181,373

HARVESTER WITH MOVING GUIDE

Eugene G. Littau, 8974 Shaw Square Rd., S.E., Aumsville, Oreg. 97325

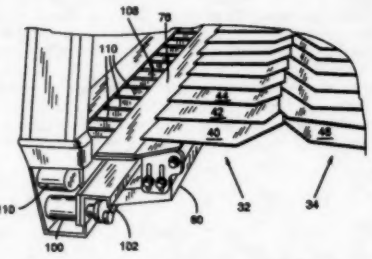
Filed Feb. 7, 1992, Ser. No. 832,430
Int. Cl.[5] A01D *46/28*
U.S. Cl. 56—329 **9 Claims**

1. In a harvester having a mobile frame mounted for movement over the ground,

a row of multiple catcher plates carried by the frame with the plates being movably supported by the frame to accommodate the movement of plants thereby,

collector means for collecting harvested material falling on the catcher plates,

a reciprocating guide means adapted to receive product moving from the collector plates and to direct such material onto the collector means, and



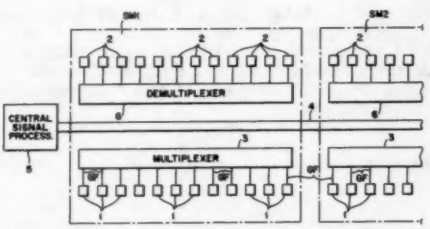
powered means for producing reciprocation of the guide means.

5,181,374

METHOD FOR SETTING THE SENSITIVITY LIMITS OF ELECTRONIC YARN CLEARERS, AND DEVICE FOR CARRYING OUT THE METHOD

Kurt Aeppli, Uster, Switzerland, assignor to Zellweger Uster AG, Uster, Switzerland

Filed Aug. 31, 1990, Ser. No. 575,800
Claims priority, application Switzerland, Aug. 31, 1989, 03154/89
Int. Cl.[5] D01N *13/26;* **B65H** *63/06*
U.S. Cl. 57—264 **17 Claims**



1. Process for setting the sensitivity limits of electronic yarn clearers taking into account the count of the yarn to be cleared comprising the steps of:

measuring the yarn count during a clearing process;

comparing the result of this measurement with set sensitivity limits, said set sensitivity limits being determined by setting the yarn clearer for a number of false alarms for a given yarn length represented as a fixed, predetermined alarm frequency limit, wherein said step of setting further includes the steps of:

continuously recording measured values of the yarn count during the clearing process and determining a yarn count distribution; and,

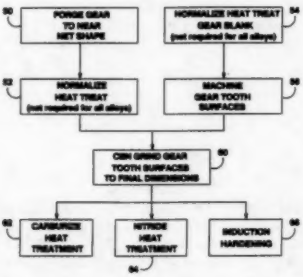
automatically fixing said sensitivity limits independently in response to statistical interrelationships of the measured values and the predetermined alarm frequency limit.

5,181,375

METHOD FOR PRODUCING STEEL ALLOY GEARS

Dan L. Thurman; Melvin B. Slane, both of Peoria; Charles F. Berndt, Pekin, and John A. Olszewski, Plainfield, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Mar. 18, 1991, Ser. No. 670,633
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—287 **8 Claims**


FORGE GEAR TO NEAR NET SHAPE
NORMALIZE HEAT TREAT GEAR BLANK
NORMALIZE HEAT TREAT
MACHINE GEAR TOOTH SURFACES
CBN GRIND GEAR TOOTH SURFACES TO FINAL DIMENSIONS
CARBURIZE HEAT TREATMENT
NITRIDE HEAT TREATMENT
INDUCTION HARDENING

5. A method for producing steel alloy gears comprising the steps of:

forging the tooth surfaces of a gear to a near net shape in which the forged tooth profile surfaces have excess material requiring subsequent removal;

grinding the gear's tooth profile surfaces to a final finish shape not requiring further material removal and introducing consistent stresses in the gear tooth surfaces;

subsequently performing a final heat treat to the ground gear to relieve the consistent stresses and impose beneficial stresses in the ground gear; and

controlling the final heat treat to provide a hardened surface layer extending to a depth not substantially greater than the minimum depth required by the function of the gear;

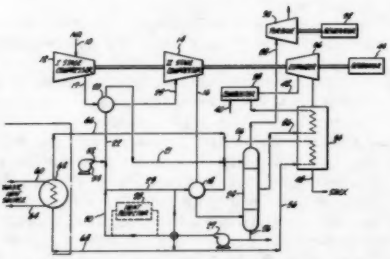
whereby the consistent stresses introduced in the grinding step cooperate with the controlled heat treat to provide minimal heat treat distortion.

5,181,376

PROCESS AND SYSTEM FOR PRODUCING POWER

Ashok D. Rao, Mission Viejo, Calif., assignor to Fluor Corporation, Irvine, Calif.

Filed Aug. 10, 1990, Ser. No. 566,608
Int. Cl.[5] F02G *3/00*
U.S. Cl. 60—39.05 **7 Claims**



1. An improved system for producing mechanical power from a combustion turbine cycle which includes a combuster, a first turbine and a multi-stage countercurrent flow humidifier to supply a water vapor/air mixture as combustion air and thermal diluent to the combuster, the improvement comprising:

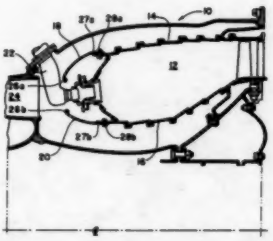
a second turbine and means for utilizing the excess water vapor/air mixture to produce additional power in the second turbine, wherein said means for utilizing the excess water vapor/air mixture includes a conduit to directly supply the excess mixture to said second turbine.

5,181,377

DAMPED COMBUSTOR COWL STRUCTURE

Phillip D. Napoli, West Chester, and John M. Koshoffer, Greenhills, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 16, 1991, Ser. No. 685,947
Int. Cl.[5] F02C *1/00*; F02G *3/00*
U.S. Cl. 60—39.31 **14 Claims**



1. A combustor cowl for use in assembled relationship with the combustor of a gas turbine engine, the cowl being of a generally annular configuration defining a central cowl axis and being axially elongated and aerodynamically contoured relative to the central cowl axis, the combustor defining a central combustor axis and the central cowl and combustor axes being aligned in the assembled relationship of the combustor cowl with the combustor, the combustor cowl comprising:

first and second plies of sheet metal respectively having generally annular and axially elongated and aerodynamically contoured configurations and each having inner and outer main surfaces and fore and aft end portions with corresponding fore and aft edges;

the first and second plies of sheet metal being assembled in mating relationship with the inner surface of the first ply of sheet metal disposed on and in surface contact with the outer surface of the second ply of sheet metal, the respective fore end portions of the first and second plies of sheet metal being curled together in a direction toward the interior surface of said second ply of sheet metal thereby to form a cowl leading edge, of a generally circular configuration in a plane transverse to and relating to the central cowl axis and of a generally arcuate cross-section in a plane extending radially from the central cowl axis, and the respective, corresponding fore edges being integrally joined, and the respective aft end portions of the first and second plies of sheet metal defining a cowl trailing edge and the respective, corresponding aft edges being integrally joined; and

the surface contact of the first and second plies producing a frictional contact force affording friction damping of vibrations induced in the cowl under normal operating conditions of the gas turbine engine.

5,181,378

VAPOR GENERATOR APPARATUS FOR POWERING A MOTOR

John A. Devine, Jr., 453 Quan, St. Louis, Mo. 63122

Filed May 16, 1991, Ser. No. 701,091
Int. Cl.[5] F02C *7/00*
U.S. Cl. 60—39.55 **2 Claims**

1. Vapor generating apparatus comprising:

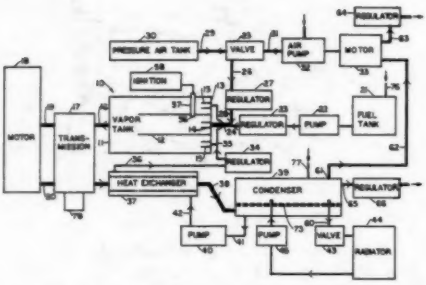
(a) a chamber in which the vapor energy is created, said chamber including a combustion space, air and fuel burner means in said combustion space, and liquid injector means adjacent said combustion space to subject the injected

liquid to the heat of the air and fuel combustion to convert the liquid to a supply of vapor energy;

(b) motor means responsive to vapor energy for operating therewith;

(c) transmission means connected to said chamber and to said motor means for supplying vapor energy to said motor means and for receiving back residual vapor energy exhausted by said motor means;

(d) condenser means having first means connective with said transmission means for receiving the vapor energy exhausted by said motor means and reducing the latter vapor



energy to a liquid injector means to supply condensate liquid thereto;

(e) air pump means operable for supplying air under pressure to said burner means;

(f) motor means connected to said air pump means and a connection is made between said condenser means and said air pump motor means for supplying vapor energy received in said condenser means to operate said air pump motor; and

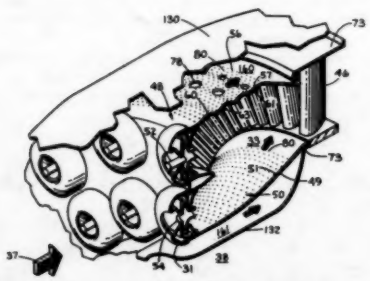
(g) fuel pump means operable for supplying a fuel to said burner means.

5,181,379

GAS TURBINE ENGINE MULTI-HOLE FILM COOLED COMBUSTOR LINER AND METHOD OF MANUFACTURE

Thomas G. Wakeman, Lawrenceburg; Alan Walker, Wyoming, and Harvey M. Maclin, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 15, 1990, Ser. No. 614,418
Int. Cl.[5] F02C *3/00*; F23R *3/06*
U.S. Cl. 60—261 **12 Claims**



1. A gas turbine combustor liner comprising:

a single wall shell having a hot side and a cold side and at least one continuous pattern of small closely spaced sharply downstream angled, from said cold side to said hot side, film cooling holes,

said continuous pattern extending essentially over the entire length of said shell,

said film cooling holes having a hole diameter, a downstream slant angle, and spaced at least sufficiently close enough together to effect a continuous cooling film on said hot side of said shell liner during combustor operation,

said film cooling holes operable to inject all of the cooling air at essentially said slant angle, and

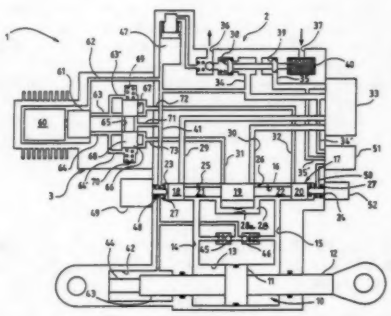
at least a portion of said shell is corrugated to form a shallow wavy wall cross-section.

5,181,380

HYDROSTATIC OPERATING MODE HYDRAULIC ACTUATOR PREFERABLY FOR BACKUP OPERATION, AND FLIGHT CONTROL SYSTEM COMPRISING IT

Christian Favre, Tournefeuille, and Dominique Van den Bossche, Rieumes, both of France, assignors to Aerospatial Societe Nationale Industrielle, Paris, France

Filed Sep. 18, 1991, Ser. No. 762,561
Claims priority, application France, Sep. 19, 1990, 90 11538
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—405 **12 Claims**



1. A hydraulic actuator system having a fluid inlet and fluid outlet, said hydraulic actuator system comprising:

at least one actuation means;

a housing hydraulically connected to said at least one actuation means, said housing containing a mobile switching member;

a hydraulic distribution unit hydraulically connected to said fluid inlet and outlet for regulating flow from said fluid inlet to said mobile switching member;

first control means for moving said mobile switching member between a neutral configuration in which said at least one actuation means is hydraulically isolated from said hydraulic distribution unit and a first active service configuration in which said at least one actuation means fluidically communicates with said hydraulic distribution unit;

pumping means fluidically connected to said mobile switching member; and

second control means for moving said mobile switching member between said neutral configuration and a second active service configuration in which said at least one actuation means fluidically communicates with said pumping means;

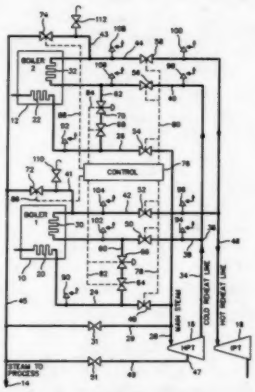
whereby said at least one actuation means and said pumping means define a hydrostatic transmission.

5,181,381

POWER PLANT WITH DUAL PRESSURE REHEAT SYSTEM FOR PROCESS STEAM SUPPLY FLEXIBILITY

Ponnusami K. Gounder, San Diego, Calif., assignor to Ahlstrom Pyropower Corporation, San Diego, Calif.

Filed Jul. 8, 1992, Ser. No. 910,010
Int. Cl.[5] F01K *13/02*
U.S. Cl. 60—648 **18 Claims**



1. A power plant having multiple steam boilers for supplying steam for processing and for powering a turbine generator comprising, in combination:

a steam turbine having at least first and second stages;

a steam powered processing unit;

a plurality of steam boilers, each having a primary steam generating means and a reheating means;

means for selectively conducting primary steam from said steam boilers to said turbine, and to said process station, return means for returning cold steam from said first stage of said turbine to said reheaters for reheating, and means for conducting reheated steam from said reheating means to a second stage of said turbine;

means for isolating at least one of said boilers from said turbine; and,

means for conducting primary steam through the reheating means of said boiler and to said processing unit.

5,181,382

HEATING/COOLING OR WARMING STAGE ASSEMBLY WITH COVERSLIP CHAMBER ASSEMBLY AND PERFUSION FLUID PREHEATER/COOLER ASSEMBLY

Thomas F. Middlebrook, 25570 Lehmann Blvd., Lake Villa, Ill. 60046

Filed Aug. 2, 1991, Ser. No. 739,454
Int. Cl.[5] G02B *21/28, 21/30*
U.S. Cl. 62—3.2 **17 Claims**

1. A stage assembly for use in a microscope comprising:

a mechanical stage having a opening therein;

a stage support plate having an opening therethrough;

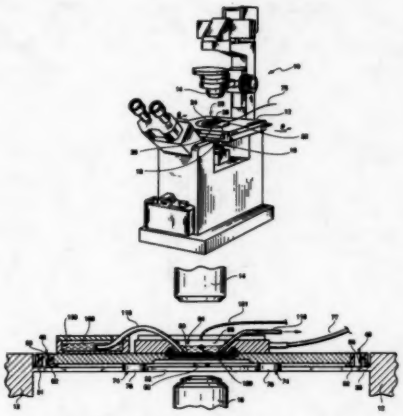
means for supporting said stage support plate in said opening in said mechanical stage;

means for heating/cooling or warming said stage support plate mounted to said stage support plate outside of a specimen chamber;

a specimen chamber/coverslip assembly mounted on top of said stage support plate above said opening therethrough;

a perfusion fluid preheater/cooler assembly mounted on top of said stage support plate;

a perfusion fluid tubing extending through said preheater/-cooler assembly and to a specimen chamber in said specimen chamber/coverslip assembly; and



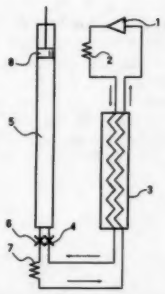
means for withdrawing perfusion fluid from said specimen chamber.

5,181,383

REFRIGERATOR

Eiichi Goto, Fujisawa; Qiquan Geng, Chigasaki, and Junpei Yuyama, 2-28-2, Morinosato, Atsugi-shi, Kanagawa-ken, all of Japan, assignors to Research Development Corporation of Japan, Tokyo and Junpei Yuyama, Atsugi, both of, Japan, a part interest

Filed Jun. 28, 1991, Ser. No. 723,384
Claims priority, application Japan, Jun. 28, 1990, 2-170787
Int. Cl.[5] F25B *9/00*
U.S. Cl. 62—6 **4 Claims**



1. A refrigerator having a room temperature portion which is not within a refrigerated environment and a low temperature portion which is within a cooled environment, the refrigerator comprising:

a compressor disposed in the room temperature portion;

an expander including a pipe and a piston disposed in said pipe, said expander at least partially disposed in said room temperature portion, and wherein said piston is provided in a portion of the expander which is disposed in the room temperature portion; and

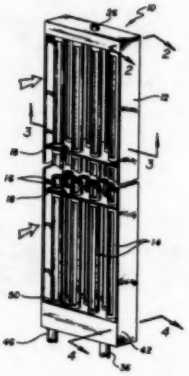
wherein said expander further includes a column of gas disposed within said expander with at least part of the column of gas disposed in the room temperature portion such that pressure between the low temperature portion and the piston is transmitted through the column of gas.

5,181,384

ICE PARTICLE SEPARATOR

Oscar A. Buchmann, San Pedro, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 4, 1991, Ser. No. 664,898
Int. Cl.[5] F25J 5/00
U.S. Cl. 62—12 18 Claims



1. An ice particle separator to extract entrained ice particles from a gaseous flow stream, comprising:

a housing;

a plurality of generally part-cylinder tubes contained in said housing and arranged in an array configured to present a concave face of said part-cylinder tubes to an inlet flow side of said ice particle separator;

means for heating said plurality of part-cylinder tubes to a temperature to cause ice particles contacting said plurality of part-cylinder tubes to melt to a liquid; and

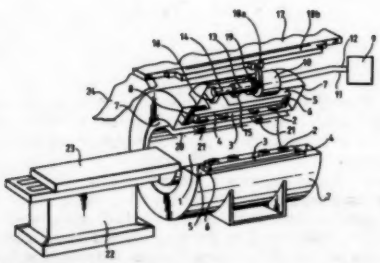
means for promoting extraction of said liquid from said gaseous flow stream.

5,181,385

CRYOSTAT AND NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS INCLUDING A CRYOSTAT

Norihide Saho, Tsuchiura; Takeo Nemoto, Shimoinayoshi, and Mitsuru Saeki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 22, 1991, Ser. No. 733,647
Claims priority, application Japan, Jul. 20, 1990, 2-190539
Int. Cl.[5] F25B 19/00
U.S. Cl. 62—51.1 20 Claims



1. A cryostat having

(a) a heat-insulating tank having an outer wall and two opposite ends and a longitudinal direction connecting said ends,

(b) a structure at least partly enclosing said tank and extending along said tank said structure comprising one or more sheet members covering said outer wall of said tank and spaced from said outer wall, said structure not being supported by said tank, and

(c) a refrigerator having a cooled member extending into said tank through said outer wall,

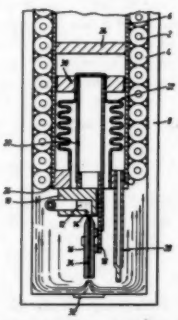
(d) said refrigerator being mounted on said structure by at least one support member which is connected to said structure at least one location spaced from a central transverse plane of said tank and proximate to an end portion of said one or more sheet members.

5,181,386

CRYOGENIC COOLING APPARATUS

Keith Brown, Worcestershire, England, assignor to The Hymatic Engineering Company Limited, Worcestershire, England

Filed Aug. 7, 1991, Ser. No. 741,130
Int. Cl.[5] F25B 19/02
U.S. Cl. 62—51.2 3 Claims



1. Cryogenic cooling apparatus, said apparatus being accommodated within a container which has a wall, a thermal load being connected to the outer surface of a portion of said wall, said apparatus comprising an inlet path through which, in use, refrigerant gas is caused to flow, a Joule-Thomson expansion nozzle which has an outlet and communicates with said inlet path and in which, in use, a proportion of said refrigerant gas is caused to liquefy, an outlet path communicating with said outlet of said expansion nozzle, said inlet path being arranged in heat exchange relationship with said outlet path, an elongate valve needle cooperating with the outlet side of said expansion nozzle and together with the latter constituting a valve, a sensor disposed in a space on the outlet side of said expansion nozzle and arranged progressively to close said valve as the amount of liquid refrigerant in contact with it increases, said valve needle affording a bypass passage which extends over its entire length and remains open at all times, said bypass passage having an outlet end which is directed towards said portion of said wall.

5,181,387

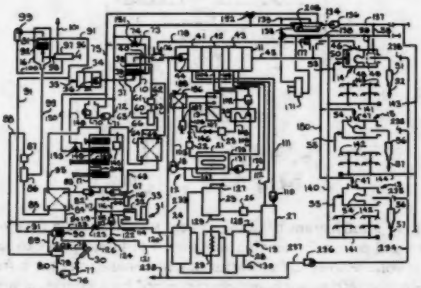
AIR CONDITIONING APPARATUS

Gershon Meckler, 725 Campbell Way, Herndon, Va. 22070

Continuation of Ser. No. 508,191, Apr. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 484,551, Feb. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 144,300, Jan. 14, 1988, Pat. No. 4,903,503, which is a continuation-in-part of Ser. No. 49,260, May 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 861,058, May 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 841,454, Mar. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 732,561, May 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 719,357, Apr. 3, 1985, abandoned. This application Jan. 17, 1991, Ser. No. 644,464

Int. Cl.[5] F25D *17/06*

U.S. Cl. 62—59 87 Claims



1. Air conditioning apparatus comprising a plurality of air outlets each of which is operable to deliver air to a space to be conditioned, means including refrigeration apparatus operable to make ice by pumping heat from water to a heat sink and to store such ice, means for dehumidifying outside air or a mixture of outside air and return air, said dehumidifying means including a coil, means for causing air to be dehumidified to flow in heat transfer relationship with said coil, and means for circulating a low temperature heat transfer fluid through said coil, said circulating means including means for transferring heat from the heat transfer fluid to ice made and stored by said means operable to make and store ice, means for circulating dehumidified air to said air outlets at a rate per unit of area in the spaces served by said air outlets which varies between a predetermined minimum rate greater than zero and a maximum rate, the maximum rate being substantially less than that which would be required to maintain the design temperature in each of the spaces at the maximum design cooling load with air supplied to the space at a dry bulb temperature of 55° F., means operable to control its moisture content and temperature so that the dehumidified air is incapable, at the rate at which it is required for humidity control, of maintaining the desired space temperature at the maximum design cooling load, means operable to control the rates at which dehumidified air is delivered by said air outlets to the spaces they serve to ones not less than the predetermined minimum rate and means for controlling the temperature of the air delivered by said air outlets to maintain the temperature of the spaces within control limits.

5,181,388

REFRIGERANT RECOVERY UNIT WITH PURE SYSTEM

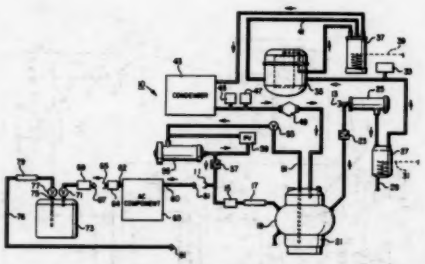
Anthony W. Abraham, Arlington, Tex., assignor to Wynn's Climate Systems, Inc., Ft. Worth, Tex.

Filed Nov. 5, 1991, Ser. No. 787,833

Int. Cl.[5] F25B *45/00*

U.S. Cl. 62—77 13 Claims

7. In a method for recovering refrigerant from an air conditioning system, comprising the steps of connecting the air conditioning system to a recovery expansion valve, converting any liquid refrigerant received from the air conditioning system into a gaseous refrigerant, evaporating the gaseous refrigerant, compressing the gaseous refrigerant after evaporation, condensing the compressed gaseous refrigerant into a liquid refrigerant and delivering the liquid refrigerant to a storage container, an improved method for purging components of the air conditioning system for cleaning, comprising:



operating the compressor and directing a flow of refrigerant drawn from the storage container, and condensed by the condenser to a component of the air conditioning system; and

receiving the refrigerant flowing through the component of the air conditioning system in a purge fluid container.

5,181,389

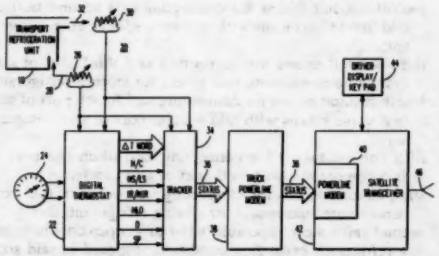
METHODS AND APPARATUS FOR MONITORING THE OPERATION OF A TRANSPORT REFRIGERATION SYSTEM

Jay L. Hanson, Bloomington, and Romuald M. Jurewicz, St. Louis Park, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Apr. 26, 1992, Ser. No. 875,861

Int. Cl.[5] F25B *49/00*

U.S. Cl. 62—126 22 Claims



1. A method of monitoring a transport refrigeration unit which conditions a load in a cargo space to a selected set point temperature via commanded cooling and heating cycles, comprising the steps of:

determining the temperature of the conditioned load,

providing a digital signal as a function of the load temperature and the set point temperature, with each toggle of the least significant bit (LSB) of the digital signal indicating a predetermined change in load temperature,

starting timing means having a predetermined timing period in response to the toggling of the LSB,

selecting the predetermined timing period as a function of the selected set point temperature,

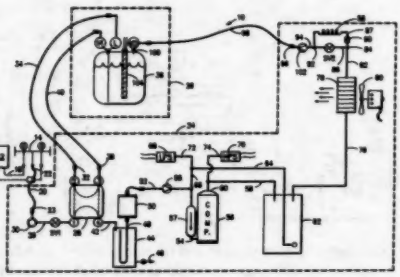
and providing an alarm signal when the selected timing period expires before the next toggle of the LSB.

5,181,390

MANUALLY OPERATED REFRIGERANT RECOVERY APPARATUS

Wayne B. Cavanaugh, 7818 Adams Rd., Kirkville, N.Y. 13082; Lowell E. Paige, 117 Ennis Ave., Pennellville, N.Y. 13132, and Chester D. Ripka, 237 Kinne St., Apt. #3, E. Syracuse, N.Y. 13057

Filed Jan. 2, 1992, Ser. No. 816,002
Int. Cl.[5] F25B *49/00*
U.S. Cl. 62—126 **5 Claims**



1. Apparatus for recovering compressible refrigerant from a refrigeration system comprising:

compressor means for compressing gaseous refrigerant delivered thereto, said compressor means having a suction port and a discharge port;

condenser means for passing refrigerant therethrough, said condenser means having an inlet and an outlet;

means for storing refrigerant;

a first valve means having a first port, a second port, a third port, and, a fourth port, said first valve means being operable to a first condition, wherein said first port is in fluid communication with said second port, and, said third port is in fluid communication with said fourth port, and to a second condition wherein said first port is in fluid communication with said fourth port;

first conduit means for connecting the refrigeration system with said first port of said first valve means;

second conduit means for connecting said second port of said first valve means with said means for storing refrigerant;

third conduit means for connecting said third port of said first valve means with said means for storing refrigerant;

fourth conduit means for connecting said fourth port of said first valve means with said suction port of said compressor;

fifth conduit means for connecting said discharge port of said compressor with said inlet of said condenser;

sixth conduit means for connecting said outlet of said condenser with said means for storing refrigerant; and

second valve means operable between an open condition and a refrigerant expanding condition, disposed in said sixth conduit;

whereby when said first valve means is in said first condition, and, said second valve means is operated to said expanding condition and, said compressor means is operating, refrigerant will be withdrawn from the refrigeration system and delivered to said means for storing refrigerant by way of said first conduit, said first and second ports of said first valve means and said second conduit; and

wherein a closed refrigeration circuit is defined by said means for storing refrigerant, said third conduit means, said ports three and four of said first valve means, said fourth conduit means, said compressor, said fifth conduit means, said condenser means and, said sixth conduit means, back to said means for storing refrigerant;

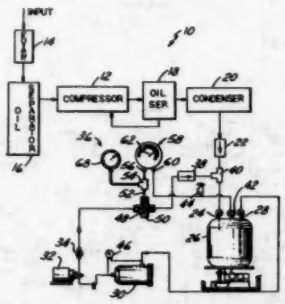
whereby refrigerant flowing through the closed refrigeration circuit passes through said second valve means and expands and passes to the storage means where it evaporates to reduce the temperature and pressure within the means for storing.

5,181,391

REFRIGERANT HANDLING SYSTEM WITH AIR PURGE AND MULTIPLE REFRIGERANT CAPABILITIES

Kenneth W. Manz, Paulding, Ohio, assignor to SPX Corporation, Muskegon, Mich.

Filed Mar. 2, 1992, Ser. No. 844,559
Int. Cl.[5] F25B *45/00*
U.S. Cl. 62—129 **15 Claims**



1. In a refrigerant handling system that includes a first volume and means for feeding refrigerant in liquid phase to said first volume so as to capture air in said volume over the refrigerant, the refrigerant being characterized by a saturation pressure that varies with refrigerant type and temperature, means for purging air captured within said first volume comprising:

first means operatively coupled to said first volume for providing an indication of actual temperature of refrigerant in said first volume,

second means operatively coupled to said first volume and responsive to refrigerant/air vapor pressure within said first volume for providing an indication of an apparent temperature of refrigerant within said first volume as a function of said refrigerant/air vapor pressure and saturation pressure/temperature characteristics of the specific type of refrigerant within said first volume, and

third means coupled to said first volume for venting air from said volume when said apparent refrigerant temperature indicated by said second means is greater than said actual refrigerant temperature indicated by said first means.

5,181,392

AIR CONDITIONER AND HEAT EXCHANGER USED THEREIN

Masaaki Itoh, Tsuchiura; Hiroaki Matsushima, Ryugasaki; Hiroshi Kogure, Sano; Mitsutaka Shizuya, Ryugasaki, and Chie Kobayashi, Ibaraki, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

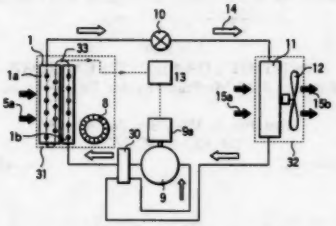
Filed Feb. 13, 1991, Ser. No. 655,144
Claims priority, application Japan, Mar. 2, 1990, 2-049268
Int. Cl.[5] F25B *13/00, 39/04*
U.S. Cl. 62—160 **17 Claims**

1. An air conditioner comprising a system in which the equipment thereof including a compressor, a four-way valve, an indoor heat exchanger equipped with a fan for blowing air into the room, an expansion valve, and an outdoor heat exchanger are connected together in such a manner as to allow a refrigerant to circulate through them and which system is equipped with a control circuit for controlling said equipment.

wherein said indoor heat exchanger is comprised of an air-upstream-side heat exchanger and an air-downstream-side

heat exchanger which are thermally separated from each other,

wherein a temperature sensor is provided at the outlet of said air-downstream-side heat exchanger, said temperature sensor is provided with an output which is fed back to said control circuit, and



wherein said equipment is controlled during the heating operation by said control circuit on the basis of the output of said temperature sensor in such a manner in which said output is kept in a range higher than the condensation temperature.

5,181,393

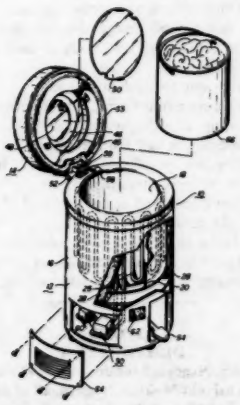
REFRIGERATED WASTE CONTAINER WITH GERMICIDAL LAMP

Gene Lott, 896 Chestnut Lake Dr., Marietta, Ga. 30068

Continuation-in-part of Ser. No. 490,302, Mar. 8, 1990, abandoned. This application Jun. 28, 1991, Ser. No. 722,917

Int. Cl.[5] F25D *23/00*

U.S. Cl. 62—264 **14 Claims**



1. A waste storage device for retarding bacterial growth by irradiating waste material in a low humidity, cool environment comprising:

a container means for holding the waste material, said container means having a cover means for sealing said container means,

refrigeration means for refrigerating the waste material in said container means,

a thermostat means for sensing the temperature in said container means and for controlling said refrigeration means,

radiation producing means disposed within the cover means for irradiating the waste material in said container means, said radiation producing means being operable when said cover means is disposed in sealing relationship with said container means and being inoperative when said cover means is removed therefrom for introducing and removing waste material from said container means,

manual control means for adjustably cycling said radiation producing means depending upon the waste material placed in said container means, and

moisture sensing means for automatically cycling said radiation producing means in response to the relative humidity in said container means.

5,181,394

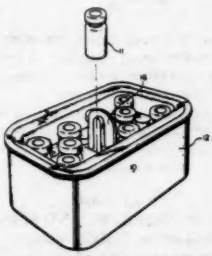
FREEZE PROTECTIVE SHIPPING UNITS

Henry E. Schea, III, Oxnard, and Kenneth M. Cleary, Jr., Newbury Park, both of Calif., assignors to Amgen Inc., Thousand Oaks, Calif.

Filed Jan. 14, 1991, Ser. No. 640,603

Int. Cl.[5] B65D *81/18;* **F25D** *3/08*

U.S. Cl. 62—371 **12 Claims**



1. A storage unit for containers of a liquid composition susceptible to physicochemical alteration upon freezing, said unit comprising:

a double-sidewalled container holder including,

an inner sidewall having formed therein cavity means accommodating the disposition of at least one said container in a position secured against movement,

an outer sidewall,

said inner and outer sidewalls of said container holder means defining an enclosed space therebetween and adjacent at least a part of said cavity means;

a phase change material disposed in and filling at least a portion of said enclosed space adjacent said cavity means, said phase change material having a freezing temperature which is higher than the nucleation temperature of said liquid composition in said container; and,

a freeze indicator means for generating an irreversible visual signal of the attainment, adjacent said cavity means, of a temperature less than the freezing temperature of said phase change material, but no less than the nucleation temperature of said liquid composition.

5,181,395

CONDENSER ASSEMBLY

Donald Carpenter, 15239 Doty Ave., Lawndale, Calif. 90260, and Craig Kushen, 447 Herondo No. 208, Hermosa Beach, Calif. 90254

Filed Mar. 26, 1991, Ser. No. 675,483

Int. Cl.[5] F25B *39/04*

U.S. Cl. 62—506 **3 Claims**

3. A remote refrigeration system, including

a housing having a bottom, a top, removable side walls, a compressor section, and a condenser section,

said compressor section and condenser section having vents that allow air to be drawn through the housing,

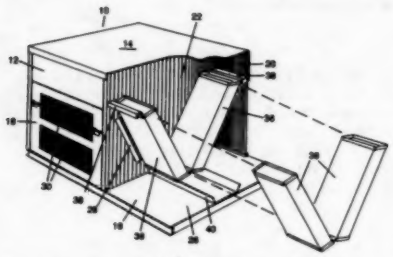
a compressor within the compressor section,

a condenser assembly within the condenser section,

said condenser assembly comprising a plurality of modular panel elements removably mounted to bracket members within the condenser section,

said panels being mounted to form a V-shaped configuration with the apex of the V-shaped panel configuration pointing towards the bottom of the housing and the mouth of the V-shaped panel configuration pointing upwardly towards the top of the housing,

each panel comprising a plurality of spaced apart, parallel



fins connected to tubing means that is disposed generally vertically, said fins being generally at a right angle to the tubing means, said tubing means carrying coolant which is circulated to the compressor, and

a fan in the top of the housing overlying the mouth of the V-shaped panel configuration for exhausting air from the housing.

5,181,396

METHOD OF FREEZING AND SEPARATION

Risto V. J. Saari, Luoma, Finland, assignor to A. Ahlstrom Corporation, Normarkku, Finland

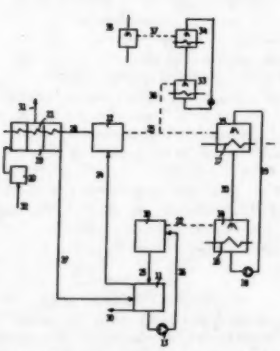
PCT No. PCT/FI89/00185, § 371 Date Mar. 15, 1991, § 102(e) Date Mar. 15, 1991, PCT Pub. No. WO90/03208, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 27, 1989, Ser. No. 663,886

Claims priority, application Finland, Sep. 28, 1988, 884466

Int. Cl.[5] B01D *9/04*; C02F *1/22*

U.S. Cl. 62—541 **10 Claims**



1. A method of concentrating a solution having a triple point, using a crystallizer, a melter, a first absorption heat pump having an absorber with absorption medium and a vapor generator, and a second adsorption heat pump having an absorber, the method comprising the steps of:

(a) freezing and evaporating a solvent of the solution in the crystallizer, the crystallizer operating at the triple point of the solution, to produce ice crystals and absorbing vapor;

(b) separating off ice crystals produced by step (a);

(c) transferring the ice crystals from step (b) into the melter;

(d) providing the absorbing vapor that is generated in the crystallizer to the first heat pump absorber, to be absorbed in the first heat pump absorption medium;

(e) cooling the absorption medium of the first heat pump with a coolant, the coolant being warmer than the vapor to be absorbed;

(f) re-evaporating the absorbed material in the vapor generator of the first absorption heat pump;

(g) melting the ice crystals into a pure liquid using some of the vapor generated in step (f); and

(h) absorbing any remaining vapor generated in step (f) in the absorber of the second absorption heat pump.

5,181,397

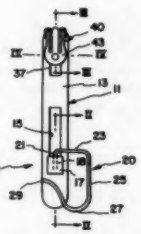
SUBSTITUTE FOR PIERCED EARRINGS

Natalie Battista, 3733 Marland Heights Rd., Weirton, W. Va. 26062

Filed Jun. 1, 1992, Ser. No. 891,191

Int. Cl.[5] A44C *7/00*

U.S. Cl. 63—12 **14 Claims**



1. A device for decorating a human ear, said ear including an external ear portion having an earlobe, said external ear portion being connected to a human head at a narrowed connection location having a peripheral surface with a top portion, said device comprising a flat, generally straight elongated body having a front surface and a rear surface, said front surface having an ornamental design thereon, said rear surface facing means for connecting said body to said ear, said connecting means comprising:

a) an elongated slot formed in one end of said body and slidably receiving a first fitting, said first fitting carrying a hook including a straight portion rotatably received within an opening in said fist fitting whereby rotative and longitudinal positions of said hook with respect to said body may be selectively adjusted;

b) a second fitting mounted at another end of said body and carrying a pivotable clip;

c) said hook being engageable over said top portion of said connection location of said external ear portion while said clip is releasably attachable to said earlobe.

5,181,398

DEHYDRATOR

Tetsukazu Tanaka, Nagoya; Masahiro Imai; Hiroshi Ikeda, both of Seto, and Yosiyuki Makino, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Aug. 15, 1991, Ser. No. 746,244

Claims priority, application Japan, Aug. 28, 1990, 2-226918

Int. Cl.[5] D06F *33/02*

U.S. Cl. 68—12.06 **3 Claims**

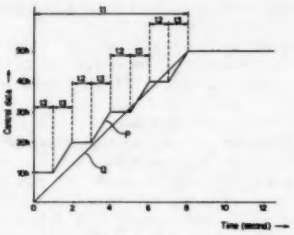
1. A dehydrator comprising:

a) a dehydration basket for containing clothes to be dehydrated;

b) a variable speed motor comprising a dc brushless motor for driving the dehydration basket so that the basket is rotated for dehydrating the clothes, the dc brushless motor being controlled so that a rotational speed thereof is varied by varying a voltage applied thereto; and

c) motor speed control means for controlling the rotational speed of the dc brushless motor so that the rotational speed of the motor is increased toward a final target rota-

tional speed by increasing a value of control data corresponding to the voltage applied to the dc brushless motor when a dehydration operation is initiated, the value of the



control data being increased for a plurality of periods, and during each period the value of the control data is held without being increased for a set period of time, so that the value of the control data is increased stepwise.

5,181,399

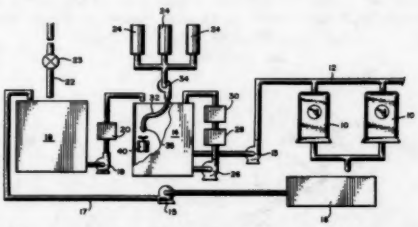
LAUNDRY WASTE WATER TREATMENT AND WASH APPARATUS

Richard B. Engel, Ft. Pierce; John B. Gallo, Port St. Lucie; Donald H. Bladen, Vero Beach, and Virginia F. Engel, Ft. Pierce, all of Fla., assignors to Tri-O-Clean Laundry Systems, Inc., Fort Pierce, Fla.

Division of Ser. No. 660,935, Feb. 26, 1991, Pat. No. 5,097,556. This application Mar. 10, 1992, Ser. No. 847,277

Int. Cl.[5] D06F *39/08*

U.S. Cl. 68—13 R **21 Claims**



1. An apparatus for washing laundry in a closed loop system using ozonated wash water comprising:

a holding tank for maintaining a supply of wash water prior to use in a wash cycle;

means for generating ozone;

means for transferring the ozone into the holding tank;

means for mixing and recirculating the ozone and the wash water in said holding tank;

washing means for washing laundry;

means for supplying the wash water and ozone from said holding tank to said washing means; and

means for collecting spent wash water from said washing means at the end of a wash cycle for reuse for washing laundry.

5,181,400

FINISH APPLICATOR

John A. Hodan, Arden, N.C., assignor to BASF Corporation, Parsippany, N.J.

Filed Jan. 25, 1991, Ser. No. 646,105

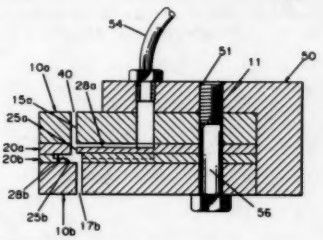
Int. Cl.[5] D06B *1/08*

U.S. Cl. 68—200 **10 Claims**

1. An apparatus for applying treatment fluid to yarn comprising:

at least one guide plate having an elongate opening formed therein;

at least one applicator plate stacked sealingly adjacent said guide plate, said opening in said guide plate forming a passageway through which multifilamentary yarn can pass and positioning the multifilamentary yarn in close proximity to an elongated fluid applicating edge of said



applicator plate; said opening and said edge defining means to spread the multifilamentary yarn and apply fluid approximately evenly to the spread yarn; and

supply means for providing treatment fluid to said edge of said applicator plate.

5,181,401

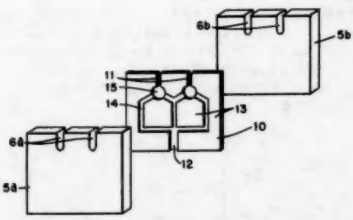
YARN COATING APPLICATOR

John A. Hodan, Arden, N.C., assignor to BASF Corporation, Parsippany, N.J.

Filed Jan. 8, 1991, Ser. No. 638,674

Int. Cl.[5] D06B *1/08*

U.S. Cl. 68—200 **12 Claims**



1. A device for subjecting yarn to treatment by fluid, the device comprising:

at least one guide having an opening formed therein;

sealingly adjoining said at least one guide block, a plate having an opening formed therein, said opening in said plate communicating with said opening in said guide block to provide a yarn passageway;

a supply means for providing treatment fluid to said plate; and

a channel formed in said plate communicating said opening in said plate with said supply means, said channel bound along its entire length on one or more sides by said at least one guide plate.

5,181,402

CABLE LOCK ASSEMBLY

Court Faessler, c/o Anvil Way, Surrey, British Columbia, V3S-4N7, and Kirk J. MacKenzie, 11763 100th Ave., Surrey, British Columbia, both of Canada

Continuation of Ser. No. 668,977, Mar. 13, 1991, abandoned. This application Feb. 19, 1992, Ser. No. 839,730

Claims priority, application Canada, Sep. 7, 1990, 2024882

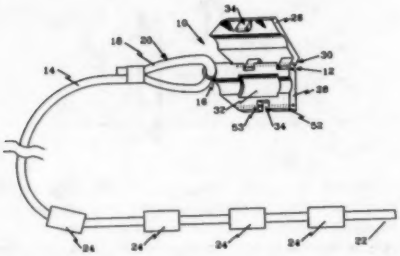
Int. Cl.[5] B65D *27/30*

U.S. Cl. 70—18 **15 Claims**

1. A cable lock assembly for bundling logs, comprising:

a lock, a cable and at least one button affixed to said cable,

said lock being affixable to said cable and including a base, a cover and a hinge rotatably connecting the base with the cover, said base having a top surface and a first cable groove extending across the top surface of the base, the first cable groove having a selected width for receiving at least part of the cross-section of the cable and having an intermediate section of greater with providing a socket for at least partly fittingly receiving one of said at least one



button affixed to said cable, said cover being rotatable about the hinge between an open position wherein said one button and adjacent sections of the cable are selectively insertable into said socket and the first cable groove of the base respectively, and a closed position wherein said cover rests against the button for releasably retaining said button in said socket without squeezing the cable, thereby preventing said cable from slipping through said lock.

5,181,403

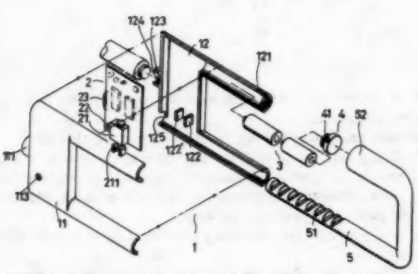
REMOTE-CONTROLLED AUTOMOBILE AND MOTORCYCLE LOCK

Jen-Hei Lii, No. 38, Chung-Te 9th Street, Tainan, Taiwan

Filed May 29, 1992, Ser. No. 890,073

Int. Cl.[5] E05B *67/22, 65/12;* B60R *25/08*

U.S. Cl. 70—38 C **3 Claims**



1. A remote controlled automobile and motorcycle lock comprising:

a U-shaped lock body consisting of a left half body and a right half body combined together, said left and right half bodies having a half female thread at an end of an upper arm, both said half female threads making up a complete female thread when both said half bodies are combined together, said left half body having a small hole in a proper location for an LED lamp to fit in, and said right half body having an opening in a vertical end wall for a lower arm of a hook rod to pass through;

an electronic device panel fixed with an electronic device including a magnetic switch combined with an inverted U-shaped member at its bottom, a biasing spring being placed between the magnetic switch and the U-shaped member, said inverted U-shaped member being drawn up by the magnetic switch when said magnetic switch is turned on by a signal from a remote electronic controller, an LED lamp fitting in the hole in the left half body and a spring switch to be turned on by a magnet in the remote electronic controller;

a battery unit in the upper arm in the lock body to supply power to the electronic device;

a T-shaped cap for closing the end of the upper arm in the lock body to keep the battery unit therein, having a male-threaded stud to screw with the female thread in the upper arm;

a U-shaped hook rod having an upper rod arm and a lower rod arm extending parallel to each other, the upper rod arm being tubular and shorter than the lower rod arm, said lower rod arm having a plurality of grooves equally spaced apart near a free end thereof, said upper rod arm fitting around the upper arm of the lock body, said lower arm fitting in the lower arm in the lock body, each said groove having a vertical wall near to the free end and a sloped wall far from the free end so that said hook lower arm can be pushed inward in the lock body freely with the sloped walls sliding under two feet in said inverted U-shaped member, but said lower rod arm can be stopped by the vertical wall of any groove when said lower rod arm is pulled outward in the lock body; and,

said inverted U-shaped member being drawn up by said magnetic switch in said electronic device, separated from any of said grooves in the lower arm in said hook arm, allowing said hook arm being pulled out of the lock body in unlocking this lock, when said remote controller sends out a wireless signal to said electronic device contained in said lock body.

5,181,404

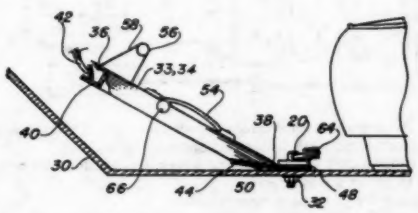
MOTOR VEHICLE BRAKE PEDAL LOCKING DEVICE

Franklin W. Baker, 1502 ½ N. LaBrea, Inglewood, Calif. 90302

Filed Sep. 30, 1991, Ser. No. 767,409

Int. Cl.[5] G05G *5/00*

U.S. Cl. 70—203 **26 Claims**



1. A theft preventing motor vehicle brake pedal locking device for use with vehicles having a foot operated brake pedal and structural floorboard, said device comprising:

a) a rigid upstanding pin positioned permanently onto a vehicle floorboard in substantial alignment with the vehicle brake pedal,

b) a locking compression member in the form of a locking channel having a front end and a back end with the front end having a pedal engagement cavity that forms a keeper with an internal configuration slightly larger than the brake pedal for containment of the pedal, and the back end having a pin bore therethrough, with said pin insertably retained in the bore mechanically linking the brake pedal with the floorboard,

c) a pair of pedal engaging arms located near the front end of said locking channel for depressing the brake pedal when installing the device,

d) a pin locking means engaging said pin preventing removal of said channel, and

e) a pair of pedal releasing arms disposed outwardly from said locking channel near the front end and above the

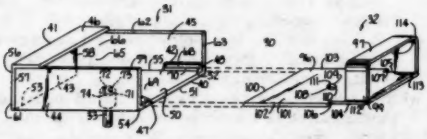
pedal engaging arms for disengaging said channel from said pin when said pin locking means has been removed for detachment of the device from the vehicle.

5,181,405

GOOSENECK TRAILER HITCH LOCK

James M. Wheeler, Rte. 1, Box 162, Willard, Mo. 65781, assignor to James M. Wheeler and Louise K. Wheeler, both of Willard, Mo.

Filed Apr. 30, 1991, Ser. No. 693,817
Int. Cl.[5] F16B *41/00*
U.S. Cl. 70—232 **11 Claims**



1. A locking device for use with a trailer gooseneck, the trailer gooseneck having a post with upper and lower ends, the upper end being attached to a trailer and the lower end being attached to a coupler, the coupler having front and rear facing portions and being adapted for releasable attachment to a towing vehicle, said locking device comprising:

(a) a first lock body adapted to receive the rear facing portion of the coupler;

(b) a second lock body adapted to receive the front facing portion of the coupler, said second lock body being adapted to cooperate with said first lock body;

(c) securing means cooperating with said first and second lock bodies to prevent undesired removal of said first and second lock bodies from the coupler;

(d) said first lock body having a bottom defining an aperture and an interior defining channels;

(e) said second lock body having a plate defining an aperture, said plate being adapted to be slidably received in said channels in said first lock body such that said aperture in said bottom of said first lock body can be aligned with and below said aperture in said plate of said second lock body when said first and second lock bodies cooperate to prevent undesired coupling;

(f) said plate of said second lock body defining notches terminating in notch ends; and

(g) said first lock body including stops in said channels, said stops abutting said notch ends to prevent complete separation of said first and second lock bodies.

5,181,406

LOCKING DEVICE CONSISTING OF KEY AND LOCKING CYLINDER

Heinz Wolter, Meiswinkel 3, 5067 Kürten, Fed. Rep. of Germany

Filed Jun. 28, 1991, Ser. No. 724,979
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1990, 9012267[U]
Int. Cl.[5] E05B *9/08, 35/08*
U.S. Cl. 70—337 **11 Claims**

1. A locking device having a key and locking cylinder suitable for actuation of electrical microswitches on keyboards, wherein

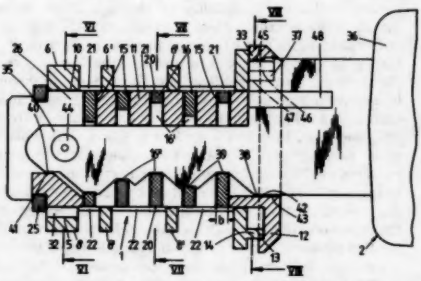
the locking cylinder comprises a locking cylinder housing having a bore, and a cylinder bore which is arranged for rotation in said bore;

a plurality of stops disposed on said locking cylinder housing;

a plurality of platelet-shaped tumblers disposed in said cylinder core, the cylinder core having a head plate, the key having a stepped-down key shaft with a radially projecting shoulder and being insertable via said head plate into the cylinder core, said key coming after a specific rotation to rest against said stops of said locking cylinder housing;

and a free space is provided between said head plate of said cylinder core arranged on a front side of said locking cylinder and a head end of said locking cylinder housing, into which free space a key-shaft shoulder of the key can enter;

said plurality of stops of said locking cylinder housing are arranged at different distances from an axis of rotation of said cylinder core, at least one of said stops protruding for



limiting an angle of rotation of said cylinder core by a striking upon the key-shaft shoulder;

said locking device further comprises a microswitch housing with grooves arranged along an interior surface of a wall of the microswitch housing facing said locking cylinder;

said locking cylinder housing has radially projecting longitudinally ribs which enter in form-locked manner into said grooves in the wall of said microswitch housing; and

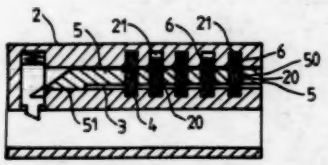
said locking cylinder housing has window-shaped openings arranged axially aligned with said longitudinal ribs for passage of ends of said platelet-shaped tumblers.

5,181,407

CARD LOCK AND A PUNCHABLE KEY CARD

Wen-Yin Wu, 2rd Rd. 8th Fl. Room #2, Kaohsiung City, China

Filed Nov. 13, 1991, Ser. No. 791,143
Int. Cl.[5] E05B *21/00*
U.S. Cl. 70—361 **9 Claims**



1. A card lock and a punchable key card for use with the card lock comprising:

a card lock including a longitudinally extending cavity therein defining upper and lower lengthwise walls along with first and second longitudinally spaced open ends, a plurality of pin tumbler holes formed in said upper lengthwise wall and opening into said cavity, and a plurality of pin tumblers movably mounted within said plurality of pin tumbler holes, each of said pin tumblers including first and second portions with a predetermined number of the second portions being longer than others such that long and short pin tumblers are defined, said card lock further including a bore formed therein into which the second end of said cavity opens;

a dead bolt slidably mounted within said bore and movable between a locked position and an unlocked position;

a dead bolt mover slidably mounted within said cavity, said

dead bolt mover including first and second longitudinally spaced ends and a plurality of through holes adapted to receive said plurality of pin tumblers, the first end of said dead bolt mover being adapted to project into said bore and engage said dead bolt to shift said dead bolt from said locked position into said unlocked position in response to sliding of said dead bolt mover within said cavity, said dead bolt mover also defining a slot between the lower lengthwise wall of said card lock and a lower surface portion of said dead bolt mover with said slot opening at the first end of said cavity; and

a punchable key card including a top surface, said key card further including a plurality of through holes formed therein at predetermined positions with said through holes corresponding in number to the number of long pin tumblers such that, in the locked position, the first portion of the short pin tumblers extend into corresponding through holes in said dead bolt mover and pin tumbler holes in said card lock so that the dead bolt mover is kept immovable with the dead bolt in the locked position, and whereby when said key card is inserted into said slot, the second portions of the short pin tumblers engage the top surface of said key card and are pushed up by said key card while the second portions of the long pin tumblers extend into the corresponding through holes in said key card such that the first portions of both of the short and long pin tumblers are substantially level with the upper surface of the cavity wherein the card engages said dead bolt mover causing said dead bolt mover to slide within said cavity, to engage said dead bolt, and the cause shifting of said dead bolt to its unlocked position.

5,181,408

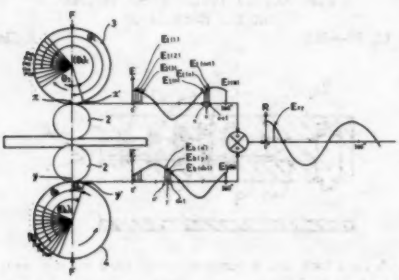
METHOD OF MEASURING AND COMPENSATING ROLL ECCENTRICITY OF A ROLLING MILL

Tse-Huei Yeh; Song-Jau Tsai; Chang-Tsun Lin, all of Kaohsiung; Long-Gee Liao, and Tsai-Sheng Huang, both of Kaohsiung Hsien, all of Taiwan, assignors to China Steel Corp., Ltd., Taiwan

Filed Mar. 20, 1991, Ser. No. 672,240

Int. Cl.[5] B21B *37/00*; G01L *5/00*; G06G *7/48*; G01D *18/00*

U.S. Cl. 72—11 **2 Claims**



1. In a rolling mill having a top work roll backed with a top backup roller and a bottom work roll backed with a bottom backup roller for rolling a plate, a method of correcting thickness variations of the plate when the plate is being rolled through a gap between the top work roll and the bottom work roll, said method comprising:

an off-line eccentricity identification method which is performed when there is no plate rolling through the mill and with the top work roll and the bottom work roll in tight contact, said off-line eccentricity identification method determining the eccentricity values of N first points which equally divide a circumference of the top backup roll and N second points which equally divide a circumference of the bottom backup roll, N being a pre-determined integer number; and

an on-line eccentricity compensation method which is performed with a plate being rolled through a gap between the work rolls, said on-line eccentricity compensation method comprising:

a. determining eccentricity values of a point on the circumference of the top backup roll and a point on the circumference on the bottom backup roll which are in contact with the work rollers by interpolating known eccentricity values determined in said off-line eccentricity identification method;

b. determining an eccentricity compensation value in accordance with the eccentricity values determined in step a;

c. converting said eccentricity compensation value of step b into a controlling signal for controlling a position of at least one of the backup rolls relative to the other backup rolls to compensate eccentricities thereof; and

d. deciding if rolling is completed, and if not, repeating steps a through d thereof until the decision of step d is positive, and terminating rolling, and

wherein said off-line eccentricity identification method determines eccentricity values of said N first points and said N second points by performing 2N times of a measurement utilizing a relationship of:

$$E_x + E_y = (1/M) * F,$$

where;

E_x is an eccentricity value of a point x at the circumference of the top backup roll in contact with the top work roll,

E_y is an eccentricity value of a point y at the circumference of the bottom backup roll in contact with the bottom work roll,

M is the mill modulus, and

F is the variation in the rolling force caused by the eccentricity;

the data from the 2N times of the measurement forming a matrix equation of $A'X=Y'$, where;

A' is a 2N by 2N square matrix;

X is a 2N by 1 vector, and

Y' is a 2N by 1 vector, and

eccentricity values of said N first points and said N second points being determined by solving the matrix equation for $X=A'^{-1}Y'$.

5,181,409

METHOD OF MANUFACTURING A WALL IRONED CAN

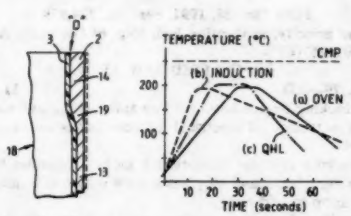
Peter J. Heyes, Wantage; Ian M. Leishman, Didcot, and Kevin J. Pope, Wantage, all of United Kingdom, assignors to CMB Foodcan plc, Worcester, United Kingdom

Filed Jul. 22, 1991, Ser. No. 734,172

Claims priority, application United Kingdom, Jul. 28, 1990, 9016602

Int. Cl.[5] B21B *45/00*

U.S. Cl. 72—46 **14 Claims**



1. A method of forming a can body from a laminate of sheet metal and a polymeric film by:

(a) applying a lubricant to both surfaces of the laminate and cutting a blank from the laminate;

(b) drawing the blank to a cup having a bottom wall and a

side wall upstanding from the periphery of the bottom wall;

(c) reducing the thickness of the side wall by pushing the cup through a wall ironing die, and

(d) washing the can body,

wherein,

in step (a) the laminate is a laminate of sheet aluminium or aluminium alloy and a film of an amorphous linear polyester or copolyester;

and after step (c) but before step (d) a terminal margin only of the side wall of the wall ironed cup is heated to a temperature above 100° C. but below the crystalline melting point of the film.

5,181,410

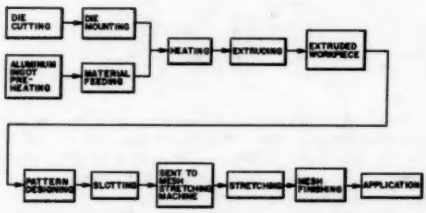
ALUMINUM MESH WITH HOLLOW RIBS AND THE RELATED WORKPIECE EXTRUDING DIE

Ching-Ming Lai, 3F-2, No. 450, Cherng Der Rd., Taipei, Taiwan

Filed Jul. 11, 1991, Ser. No. 728,375

Int. Cl.[5] B21C *25/04*

U.S. Cl. 72—256 **3 Claims**



1. An extrusion die for use in an aluminum extrusion process comprising:

a first die unit formed with a plurality of aligned tooth-form holes in a middle portion thereof, said tooth-form holes being interconnected to form a unitary die extrusion outlet; and

a second die unit having a plurality of raised blocks which are aligned and spaced across a middle portion of said second die unit, at least some of said raised blocks having a cross-sectional lateral dimension at a central portion thereof greater than their opposing ends to define portions which taper from the central portion toward their opposing ends, wherein when said second die unit is secured to said first die unit, said plurality of raised blocks extend within said plurality of aligned tooth-form holes with gaps thereabout such that when a material is extruded through the gaps, the tapered portions of said at least some of said raised blocks function to correctly position the plurality of raised blocks within the tooth-form holes and a panel-like workpiece can be formed having a plurality of uniform, elongated hollow ribs joined by connecting strips.

5,181,411

GRIPPER MEANS FOR STRETCHER LEVELER APPARATUS

Bertram A. Holloway, 150 Karen Dr., Washington, Pa. 15301

Continuation of Ser. No. 575,167, Aug. 29, 1990, Pat. No. 5,077,887, which is a division of Ser. No. 376,387, Jul. 6, 1989, Pat. No. 4,982,593, which is a continuation-in-part of Ser. No. 819,028, Jan. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 485,275, Apr. 15, 1983, abandoned. This application Oct. 25, 1991, Ser. No. 782,416

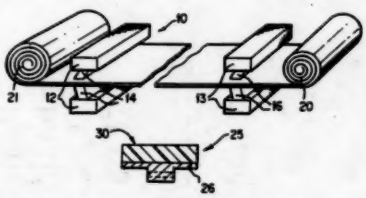
The portion of the term of this patent subsequent to Jan. 8, 2008, has been disclaimed.

Int. Cl.[5] B21D *25/04*

U.S. Cl. 72—302 **6 Claims**

1. A stretcher leveler apparatus comprising a first gripping jaw adapted to be closeable with an identically aligned second gripping jaw, whereby both jaws of a first pair can hold firmly one section of an uncoiled metal strip passing therebetween during the periods of high stress elongation of the strip length lying between the first pair defining one end of the metal strip and a second pair of opposing gripping jaws operating simultaneously at a distance from the first pair of jaws and forming the second end of the elongating strip section to be elongated, the improvement comprising each jaw having a gripper means consisting essentially of

a. a high density, cast polyurethane gripping surface adapted for engagement with the metal section to be stretched and



operatively anchored to the contact jaw faces, said gripping surface being positioned in a plane parallel to the surface of the metal to be engaged, and

b. said gripping surface includes an integral reinforcing means made of steel adapted to maintain the transverse rigidity of the said surface during coil engagement and the forces incident to elongation of a strip length when forces are applied to the metal through the jaws, said gripping surface being operatively anchored to each jaw through the reinforcing means, said gripping surface being cast in situ on the reinforcing means.

5,181,412

APPARATUS BENDING HOLLOW PROFILES INTO SPACER FRAMES FOR INSULATING GLASS

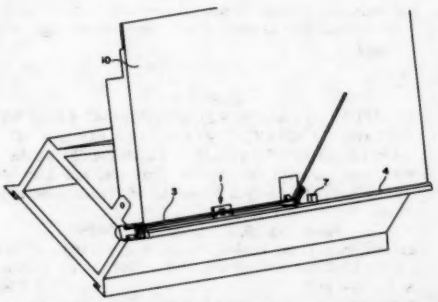
Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmening, Austria

Filed Mar. 29, 1991, Ser. No. 677,581

Claims priority, application Austria, Mar. 30, 1990, 742/90; Sep. 10, 1990, 1840/90

Int. Cl.[5] B21D *7/00, 43/10*

U.S. Cl. 72—307 **8 Claims**



1. In apparatus for bending hollow polygonal profiles (3) into spacer frames for insulating glass panes, comprising a bending system (8, 9) and a conveyor (4) to move the hollow profile (3); the improvement comprising only a single gripper (2) in said apparatus, said single gripper being adapted to be releasably secured to the hollow profile (3) and which both moves by a pre-selected distance parallel to the conveyor (4) and releases the hollow profile (3) during a bending operation, whereby said single gripper (2) grips the hollow profile (3) not

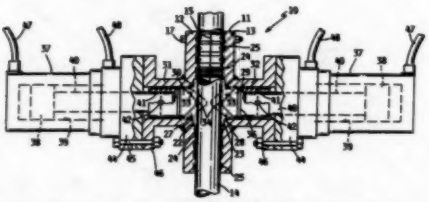
only during advance of the hollow profile into a bending position but also during the onset of bending, and an incremental pickup (6) disposed on said apparatus for measuring said preselected distance of displacement of said single gripper (2).

5,181,413

PIPE COLLAPSING ATTACHMENT

Roy E. LaBounty, Two Harbors, Minn., assignor to LaBounty Manufacturing, Inc., Two Harbors, Minn.

Filed Apr. 12, 1991, Ser. No. 685,477
Int. Cl.[5] B21D *7/06*
U.S. Cl. 72—416 **8 Claims**



1. An apparatus for collapsing rigid, metal heavy-duty casings and pipes, comprising:

an elongate two-part head portion embracing a casing to define an elongate closed chamber portion surrounding the outer surface of the casing and extending longitudinally along the length of the casing, said head portion having end portions at longitudinally opposite ends thereof and side portions which extend longitudinally and circumferentially along the length of the casing and between the opposite ends, said head portion also comprising longitudinally spaced clamping portions located at the opposite end portions and encircling the casing to clamp onto and tightly grip the casing to minimize liquid leakage from the chamber portion and along the casing, the two-part head portion being separable,

a pair of casing collapsing rams, each ram enclosed within one part of the two-part head portion between said spaced clamping portions and within the opposite side portions, said rams being movable towards one another across portions of said closed elongate chamber portion, and said rams comprising spaced engaging portions to confront, engage and apply pressure onto opposite sides of the casing for collapsing and closing the casing sufficiently to close off flow of fluid through said casing,

and hydraulic cylinder power portions affixed onto the head portion and driving each of the collapsing rams against the casing.

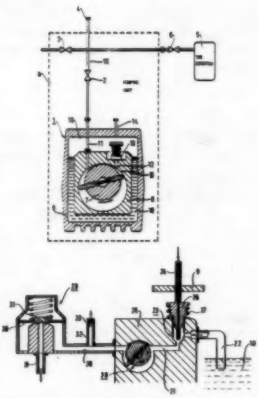
5,181,414

PUMPING APPARATUS FOR PUMPING A GAS BY MEANS OF AN OIL-SEALED VANE PUMP AND APPLICATION TO HELIUM LEAK DETECTORS

Gilles Baret, Annecy; Jean-Pierre Chicherie, and Jean-Marc Paquet, both of Annecy le Vieux, all of France, assignors to Alcatel Cit, Paris, France

Filed Aug. 28, 1991, Ser. No. 750,999
Claims priority, application France, Aug. 28, 1990, 90 10709
Int. Cl.[5] G01M *3/04*; F04B *23/12*; F04C *27/02, 29/10*
U.S. Cl. 73—40.7 **5 Claims**

1. Pumping apparatus for pumping a gas comprising a vacuum pump of the vane-and-oil-seal type (1) immersed in a closed tank (9) partially filled with oil (10), said vacuum pump comprising a vacuum pump suction duct for pumping said gas, said vacuum pump suction duct passing through a wall of the tank, a non-return valve (13) for delivering pumped gas by said vacuum pump into a space (19) in said tank situated above the level of the oil (10), an opening (14) within the wall of the tank to communicate said space (19) with the outside to remove pumped gas, an oil pump (20) located in said tank for renewing the oil seal of the vacuum pump, said oil pump including an oil pump suction duct, an oil pump oil intake tube opening at one end to the oil within the tank and at a second end to said oil pump suction duct, and an oil pump outlet duct coupled to said vacuum pump for renewing the oil seal of the vacuum pump, said oil pump further comprising a noise-reducing mixing



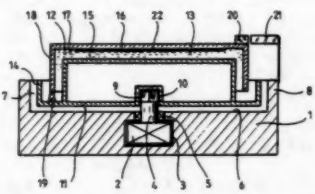
device, said mixing device including means for mixing a noise-reducing gas with said oil prior to entering said oil pump suction duct, and said oil pump further comprising a pipe (24) passing through the wall of the tank (9) for feeding said noise-reducing gas from the outside of the tank to said mixing device, and said mixing device being interposed between said oil pump oil intake tube and said oil pump suction duct.

5,181,415

APPARATUS FOR DETECTING A CHANGE OF VISCOSITY BY MEASURING A RELATIVE SLIP, IN PARTICULAR FOR DETECTING THE COAGULATION RATE OF BLOOD

Daniel Esvan, Maffliers, and Jean P. Roisin, Saint Maur des Fosses, both of France, assignors to Serbio, France

Filed Jul. 18, 1991, Ser. No. 732,388
Claims priority, application France, Jul. 20, 1990, 90 09284
Int. Cl.[5] G01N *11/14, 33/49*
U.S. Cl. 73—54.28 **7 Claims**



1. An apparatus for detecting a change of viscosity of a fluid medium in time, comprising a drive element and a driven element having respective facing walls which define therebetween a chamber of calibrated volume adapted to receive a fluid sample, the driven element being driven in relative rotation by the drive element with a relative slip which depends on the viscosity of the fluid which provides coupling between the two elements and means for measuring the relative change of slip, wherein said measuring means comprise a magnetic means cooperating with a block of magnetic material for immobilizing the driven element until the moment when the coagulation

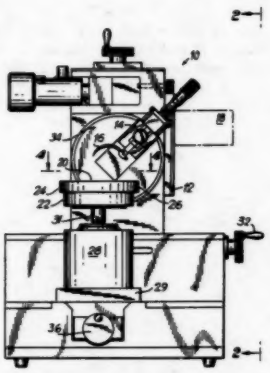
causes the facing walls to adhere together with sufficient force to cause said driven element to be driven.

5,181,416

APPARATUS AND METHOD FOR TESTING POINT SHARPNESS OF NEEDLES

Alfred G. Evans, Torrington, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Jun. 20, 1990, Ser. No. 541,055
Int. Cl.[5] G01N *3/58*
U.S. Cl. 73—104 19 Claims



1. An apparatus for determining the sharpness of the point of a needle of substantially circular configuration which comprises:

means to measure force in a predetermined direction;

needle penetrable means connected to said force measuring means and penetrable by the point of the needle to be tested;

means to grip the needle to be tested in a manner for rotation;

means to selectively align the needle adjacent said needle penetrable testing means, said alignment means comprising a substantially circular radius segment supported by a member so that said radius segment is movable to and away from a position adjacent the needle test location so as to permit alignment of the needle with respect to said needle grip means such that the center of the needle is substantially coincident with the upper surface of said needle penetrable means at a preselected location and orientation to permit the needle to penetrate said needle penetrable means at a predetermined location and in the predetermined direction and orientation with respect to said needle penetrable means;

means to cause the needle to rotate so as to penetrate said needle penetrable means; and

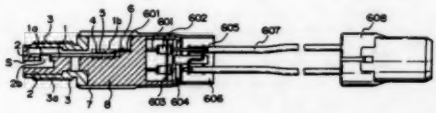
means to determine the force exerted by the needle on said needle penetrable means.

5,181,417

PRESSURE DETECTING DEVICE

Minoru Nishida, Okazaki; Naohito Mizuno, Aichi; Yoshinori Ohtsuka, Okazaki; Tadashi Ozaki, Gamagori, and Hiroshi Uesugi, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Continuation of Ser. No. 550,758, Jul. 10, 1990, abandoned. This application Dec. 13, 1991, Ser. No. 807,629
Claims priority, application Japan, Jul. 10, 1989, 1-178636; Jul. 11, 1989, 1-178440; Aug. 8, 1989, 1-205095; May 21, 1990, 2-130530
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—115 22 Claims



1. A pressure detecting device for measuring combustion pressure in an internal combustion engine which directly faces an inside of a pressure chamber thereof, including a pressurized fluid at a high temperature and high pressure atmosphere, comprising:

a cylindrical housing having a front end thereof which is arranged to be inside said pressure chamber;

an element holder for supporting a sensing element on a surface thereof which is held at the front end of said cylindrical housing, said element holder constituting a pressure passage by which said pressurized fluid is conducted into said housing;

said sensing element comprising semiconductor strain gauge elements for detecting pressures of said pressurized fluid conducted into said pressure passage;

said sensing element being secured on a surface of said element holder and which has a one main surface on which a pressure receiving diaphragm is provided and on which said semiconductor strain gauge elements are formed, said sensing element having a rectangular parallelopiped configuration which extends in a longitudinal direction so that a first end and a second end are opposed at a predetermined interval in the longitudinal direction of said parallelopiped configuration and a longitudinal axis thereof being arranged in parallel with a longitudinal axis of said pressure passage;

an outlet of a lead wire which is arranged adjacent to said second end of said sensing element located spaced from said front end of said pressure passage and at a specific distance from said pressure receiving diaphragm so as to prevent deterioration of said lead wire, bonding wires or connecting portions formed therebetween caused by the temperature of said pressurized fluid; and

wiring means for connecting said semiconductor strain gauge elements disposed in said pressure receiving diaphragm and said lead wire outlet, said wiring means formed on a surface of said element holder.

5,181,418

DEVICE FOR MONITORING THE PRESSURE OF A MEASUREMENT CHAMBER CHARGED WITH THE PRESSURE OF A VEHICLE TIRE

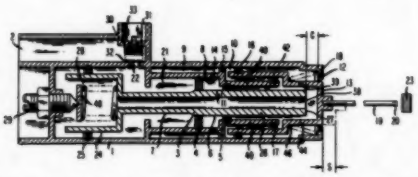
Peter Bartscher; Günther Singbartl, both of Hanover; Erwin Petersen, Wunstorf, and Helmut Ulrich, Springe, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Feb. 19, 1991, Ser. No. 657,500

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1990, 4005897

Int. Cl.[5] B60C *23/02*; G01L *7/16*

U.S. Cl. 73—146.3 **32 Claims**



21. A device for monitoring the pressure of a measurement chamber subjected to the pressure of a vehicle tire comprising

an actuator for generating a signal indicating a pressure drop in a measurement chamber, wherein the actuator is actuated against a restoring force of a first spring based on the pressure in the measurement chamber;

a valve device disposed within the measurement chamber and controlled dependent on the pressure in the measurement chamber, wherein the actuator is connected to the measurement chamber in case of a pressure drop through actuation of the valve device;

a second spring engaging the valve device for control and actuation of said valve device and thereby subjected to the pressure in the measurement chamber;

the improvement comprising

an auxiliary actuator including a section, serving also as a valve body of the valve device, a piston-shaped extension, and an extension piece, wherein the second spring is disposed and structured to act on the piston-shaped extension of the auxiliary actuator, wherein the auxiliary actuator serves for an auxiliary generation of a path distance and, in case of a pressure drop, acts mechanically onto the actuator against the restoring force of the first spring or in the same direction onto a transfer mechanism actuable by the actuator.

5,181,419

SAMPLING OF DRILLING MUD

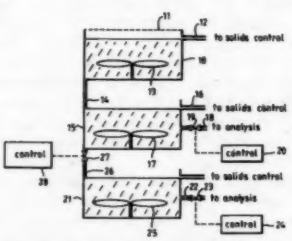
Martin Thompson, Cambridge, England, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Nov. 20, 1990, Ser. No. 616,443

Claims priority, application United Kingdom, Nov. 27, 1989, 8926778

Int. Cl.[5] G01N *35/00*; E21B *49/00*

U.S. Cl. 73—153 **14 Claims**



1. A method of sampling drilling mud which is circulating in a well and surface circulation system, the method comprising directing a sample flow comprising a part of the circulating drilling mud from the surface circulation system into an agitated container, sampling the contents of the container at a substantially regular rate, and analysing the samples, wherein the size of the container is such that the residence time of a quantity of mud corresponding to an amount removed in sampling is significant compared to the rate at which the container contents are sampled, the sample flow being a continuous sample flow taken from a first container in the surface circulation system and fed into an agitated second container from which an intermittent flow is taken into a third container, the samples to be analysed being taken from the third container.

5,181,420

HOT WIRE AIR FLOW METER

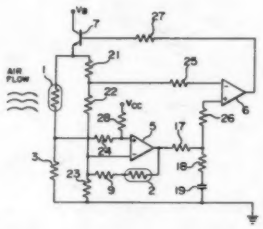
Masayoshi Suzuki, Hitachiota, and Masuo Akamatsu, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 14, 1990, Ser. No. 537,772

Claims priority, application Japan, Jun. 14, 1989, 1-149658

Int. Cl.[5] G01F *1/68*

U.S. Cl. 73—204.15 **18 Claims**



6. A hot wire type air flow meter, comprising:

a hot wire to be located in an air flow path;

means for supplying a heating current to one end of said hot wire;

means connected to the other end of said hot wire for detecting a value of heating current flowing through said hot wire;

control means, including an amplifier having a non-inverting input terminal to which an output of said heating current detecting means is connected, an inverting input terminal, and an output terminal, for controlling said heating current supplying means to keep the temperature of said hot wire constant;

feedback means connected to supply a current, which represents a level of said heating current, from said one end of said hot wire to said inverting input terminal of said amplifier;

compensating means connected to the output terminal of said amplifier for compensating for a phase of an output of said amplifier;

a temperature compensating circuit, having a thermal resistor to be located in said air flow path, connected between said output terminal of said amplifier and ground for compensating for the temperature of air to be measured.

5,181,421

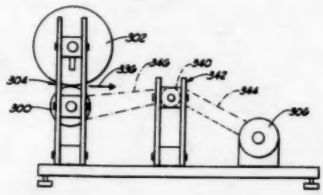
AUTOMATIC MONITORING OF COMPOSITE PREPREGS

Ronald A. Kline, Norman, Okla., assignor to Board of Regents of the University of Oklahoma, Norman, Okla.

Continuation of Ser. No. 556,087, Jul. 20, 1990, Pat. No. 5,127,268, and a continuation-in-part of Ser. No. 371,653, Jun. 21, 1989, Pat. No. 5,031,457, which is a continuation of Ser. No. 309,004, Feb. 7, 1989, abandoned, which is a continuation of Ser. No. 147,155, Jan. 22, 1988, abandoned. This application Jun. 3, 1991, Ser. No. 709,722

Int. Cl.[5] G01N *29/00*

U.S. Cl. 73—597 **16 Claims**



1. An on-line method using a processor for non-destructively determining fiber volume fraction and resin porosity of a composite material wherein the following parameters of the composite material or prepreg are known: density, elastic modulii of the constituent materials and layup sequence, the method comprising:

supporting a transducer assembly above the composite material or prepreg;

moving the composite material or prepreg under the transducer assembly and periodically stopping the moving the composite material;

propagating two independent acoustic waves via the transducer assembly through the composite material each time the moving the composite material under the transducer assembly is stopped:

receiving the acoustic waves propagated through the composite material in the processor;

determining in the processor the velocity of each of the two acoustic waves propagated through the composite material from the received acoustic waves propagated through the composite material, the respective velocity being V_1 and V_2;

determining the thickness of the composite material and inputting the thickness into the processor; and

determining in the processor the fiber volume fraction and resin porosity of the composite material using the velocities, V_1 and V_2, the thickness and the known parameters of density, the elastic modulii of the constituent materials and layup sequence.

5,181,422

DIAPHRAGM TYPE FLUID PRESSURE GAUGE

Robert F. Leonard, Trumbull, and Carl J. Styckiewicz, Meridan, both of Conn., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 30, 1991, Ser. No. 738,191

Int. Cl.[5] G01L *7/08*

U.S. Cl. 73—715 **12 Claims**

1. A diaphragm operated, fluid pressure gauge comprising, in combination:

a molded thermoplastic case having a generally cup-shaped configuration with an annular side wall and an integral base portion;

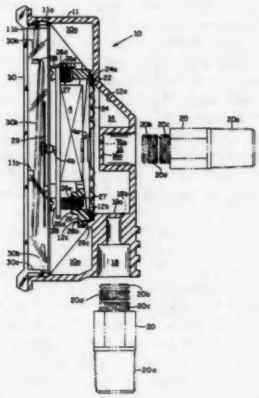
said base portion defining a chamber having an open end defined by an annular sealing surface;

an annular gasket sealable on said annular sealing surface;

a circular diaphragm having a peripheral rim portion abuttable with said annular gasket;

a thermoplastic retaining ring having two radial side surfaces, one of said radial side surfaces being abuttable with said peripheral rim portion of said diaphragm to clamp said peripheral rim portion of said diaphragm to clamp said peripheral rim portion in sealing engagement with said annular gasket and said annular gasket in sealing relation with said annular sealing surface;

said thermoplastic retaining ring being melt-welded to said base portion at a plurality of peripheral regions radially outside said gasket;



means on the other of said retaining ring radial side surfaces for mounting a pointer operating movement in operative relationship with the central portions of said diaphragm; and

means in said base portion defining a fluid passage between said chamber and a source of fluid pressure to be measured.

5,181,423

APPARATUS FOR SENSING AND TRANSMITTING IN A WIRELESS MANNER A VALUE TO BE MEASURED

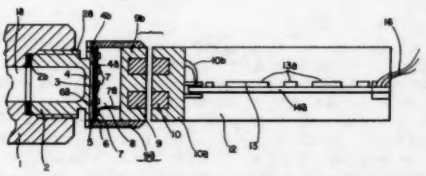
Michael Philipps, Darmstadt; Hans-Dieter Schad, Weiterstadt, and Wolfgang Viel, Darmstadt, all of Fed. Rep. of Germany, assignors to Hottinger Baldwin Messtechnik GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 11, 1991, Ser. No. 775,828

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1990, 4033053

Int. Cl.[5] G01H *9/12*

U.S. Cl. 73—724 **20 Claims**



1. An apparatus for sensing and transmitting in a wireless manner a value to be measured, comprising sensor transponder means for sensing said value, interrogator receiver means for interrogating and receiving said value from said sensor transponder means, inductive coupling means in said sensor transponder means, and in said interrogator receiver means for at least temporarily providing a transmission path between said sensor transponder means and said interrogator receiver

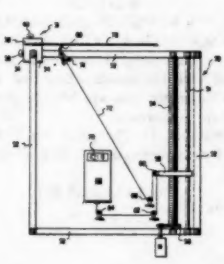
means, said sensor transponder means comprising a measuring oscillator circuit including a first frequency determining circuit component for producing a measuring frequency that varies with changes in said value to be measured, whereby said measuring frequency provides a measured frequency signal representing a measured value, said sensor means further comprising a reference oscillator circuit including a second frequency determining circuit component of substantially the same construction as said first frequency determining circuit component, said reference oscillator circuit being uninfluenced by said changes in said value to be measured for providing a reference frequency signal, said sensor transponder means further comprising computer circuit means connected to receive said reference frequency signal and said measured frequency signal, said computer circuit means comprising frequency divider means for dividing said reference frequency to provide a gating signal having a gating frequency substantially smaller than said measured frequency, said computer means further comprising gate circuit means controlled by said gating signal for passing said measured frequency signal through said gate circuit means, impulse counter circuit means responsive to said gate circuit means for counting impulses of said measured frequency signal during a time duration determined by said gating signal, an electronic switch means connected to receive counted and processed impulses from said gate circuit means, said inductive coupling means comprising a first oscillating transponder coupling circuit in said sensor transponder means and a second oscillating interrogator coupling circuit in said interrogator receiver means, said first oscillating coupling circuit being loaded by said electronic switch for inductively transmitting a signal from said first coupling circuit to said second coupling circuit in accordance with counted impulses to thereby transmit a measured value to said interrogator receiver means.

5,181,424

TEAR-STRIP TESTING APPARATUS

James E. Martin, Mason, and Richard G. Robison, Cincinnati, both of Ohio, assignors to International Paper Company, Purchase, N.Y.

Filed Apr. 18, 1991, Ser. No. 686,976
Int. Cl.[5] G01N *3/08*
U.S. Cl. 73—835 **4 Claims**



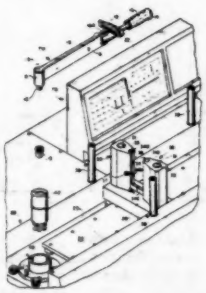
1. An apparatus for testing tear strips in paperboard blanks, the apparatus including a rigid frame, the frame carrying a first clamp for clamping a paperboard blank having a tear strip, a force gauge carried by the frame, a flexible wire having one end attached to the force gauge and having its other end attached to a clip adapted to be attached to the free end of a tear strip on a paperboard blank, a first pulley, said first pulley fixedly attached to the frame, the flexible wire passing around the first pulley, means for exerting a pull on the flexible wire so as to move the clip in a direction generally toward the fixed pulley said force gauge fixedly attached to said frame, and wherein said means includes a threaded, rotatable rod carrying a non-rotating nut movable along the rod upon rotation of the rod, said threaded rod adapted to be rotatably coupled to a motor, the non-rotating nut carrying a second pulley, the flexible wire passing around the second pulley, whereby rotation of the threaded rod causes the second pulley to exert a pull on the flexible wire.

5,181,425

APPARATUS AND METHOD FOR TESTING TORQUE WRENCHES

Troy W. Livingston, Northbrook, Ill., assignor to Ryeson Corporation, Franklin Park, Ill.

Filed May 2, 1991, Ser. No. 694,805
Int. Cl.[5] G01L *3/00*
U.S. Cl. 73—862.08 **20 Claims**



1. Apparatus for automatically testing the accuracy of a torque wrench that includes an elongated beam having at one end a work engaging portion having a pivotal axis and having at the other end thereof a hollow handle pivotally mounted thereon about a pivotal axis and a calibrated torque measuring gauge also mounted thereon adjacent said handle for cooperation with a pointer arm of said wrench, comprising:

(a) a housing presenting an external work station and a control/display panel;

(b) means at said work station for holding said wrench in a horizontal plane;

(c) means for applying a specific predetermined torque load to said one wrench end;

(d) means for limiting movement of said other wrench end while said torque load is being applied to said one wrench end;

(e) means for measuring the torque load being applied to said one wrench end for comparison with a torque load indicated on said wrench gauge;

(f) said movement limiting means including at least one vertically disposed pylon presenting a narrow, elongated, flat, vertical surface arranged and disposed for engagement with a central portion of said wrench handle;

(g) said pylon being mounted for pivotal movement about a vertical axis, so that, when said handle is moved against said surface, free pivotal movement of the pylon will maintain said handle in coaxial relation with said other wrench end to prevent an end of said handle from contacting said beam and thereby changing a working length of said beam, the distance between the pivotal axes of said work engaging portion and said handle, used in calculating the torque applied.

5,181,426

APPARATUS FOR SIMULTANEOUS MEASUREMENT OF RADIAL FORCES IN A RING-LIKE CLAMP

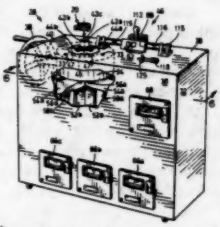
Lev Kovalsky, Hamilton, Canada, assignor to Tridon Limited, Burlington, Canada

Filed Jul. 10, 1991, Ser. No. 727,762
Int. Cl.[5] G01L *5/00*
U.S. Cl. 73—862.541 **11 Claims**

1. Apparatus for the simultaneous measurement of radial

forces in at least three directions on a clamp having a generally ring-like configuration, the apparatus comprising:

at least three relatively movable fingers, each finger having a bearing surface adapted to bear against the clamp at a pre-selected test diameter of the clamp and defining the active end of a lever having a pivot pivoted to swing at a reactive end remote from the finger in response to a load applied to the finger;



at least three brackets each associated with a finger and carrying the pivot for the levers;

at least three load cells each associated with a finger and adapted to measure force by means of an associated load sensor oriented in abutment with the reactive end of the associated lever so as to respond to said swing of the lever; and

display means associated with the load cells to display a quantification of the forces transmitted to each load cell.

5,181,427

THERMALLY-RELEASABLE-SAMPLE COLLECTING DEVICE

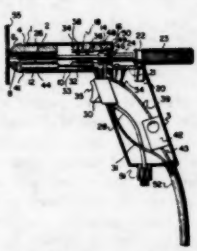
Lorne Elias, Nepean; André H. Lawrence, Gloucester, and Francis W. Lemon, Ottawa, all of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Apr. 23, 1991, Ser. No. 689,483

Claims priority, application Canada, May 2, 1990, 2015971

Int. Cl.[5] G01N *1/24*

U.S. Cl. 73—863.12 **7 Claims**



1. A thermally-releasable-sample collecting device, comprising:

a) a pistol-shaped casing, having an open ended, tubular barrel portion and a handle portion,

b) a surface probe, secured and sealed to a front end of the tubular, barrel portion, the probe having an exposed, blunt, front end and a sample passage extending therethrough from the blunt end to the tubular, barrel portion interior,

c) an adsorber tube locating collar secured and sealed to a rear end of the tubular, barrel portion,

d) an adsorber tube having a front, open, sample adsorbent end portion,

e) means releasably securing the adsorber tube within the tubular, barrel portion with a rear end portion of the adsorber tube located in the collar and the front, open, sample adsorbent end portion of the adsorbent tube located in a central portion of the sample passage of the probe and terminating therein adjacent the blunt end of the probe, and

f) means for drawing air into and along the adsorbent tube from the front, open, sample adsorbent end portion thereof.

5,181,428

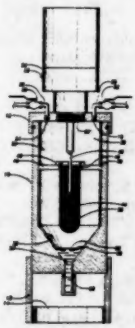
METHOD AND MEANS FOR TESTING SOIL SAMPLES

Colin D. Chriswell, Slater, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 29, 1990, Ser. No. 530,903

Int. Cl.[5] G01N *33/24*

U.S. Cl. 73—863.12 **10 Claims**



1. A device for testing soil samples to determine the presence of hydrocarbon contaminants, comprising, a closing container having an interior compartment having upper and lower portions,

means for introducing into said container a liquid having the general properties of butane, said general properties including being a hydrocarbon, being in a gaseous state under normal temperature and pressure, and being convertible to a liquid state when subjected to pressure,

operator closable means for maintaining sufficient pressure within said closed container to liquefy at least a portion of the liquid and for allowing pressure in the closed container to e released to allow at least a portion of the liquid to return to a gaseous state and to exit from said container,

a soil sample filter container suspended in said container above said bottom portion thereof,

and a condensation means in said closed container and positioned above said filter container to cause gas evaporating from said liquid to liquefy as condensate on said condensation means, to drip into said filter container and to leach through a soil sample therein, and to collect in the bottom portion of said closed container, whereby a hydrocarbon residue will be left int eh bottom portion of said container after said closeable means has been opened to permit said liquid to evaporate.

5,181,429

HEADLAMP POSITIONING DEVICE

Edmond Sieber, Donatyre, Switzerland, assignor to Saia AG, Switzerland

Filed Jul. 24, 1991, Ser. No. 734,928

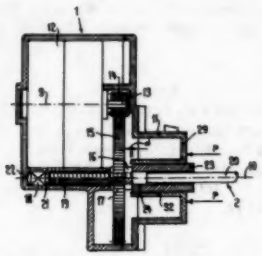
Claims priority, application Switzerland, Jul. 26, 1990, 02486/90

Int. Cl.[5] F16H *27/04;* H02P *8/00;* B60Q *1/06*

U.S. Cl. 74—89.15 **15 Claims**

1. A device for positioning an element capable of attaining different predetermined positions between two extreme positions, comprising a driving shaft coupled to said element, said

driving shaft being driven by a stepping motor, said device including means for counting steps taken by said stepping



motor and reinitiating said counting, said stepping motor being controlled by an open-loop control.

5,181,430

FINE ADJUSTMENT CONTROL MECHANISM FOR ORIENTATION AND/OR POSITIONING OF A PAY LOAD

Fabio Panin, Valkenburg, Netherlands, assignor to Agence Spatiale Europeenne, Paris Cedex, France

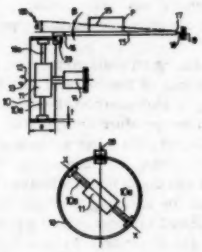
PCT No. PCT/FR90/00498, § 371 Date Dec. 30, 1991, § 102(e) Date Dec. 30, 1991, PCT Pub. No. WO91/00976, PCT Pub. Date Jan. 24, 1991

PCT Filed Jul. 3, 1990, Ser. No. 778,884

Claims priority, application France, Jul. 6, 1989, 89 09098

Int. Cl.[5] F16H *21/44*

U.S. Cl. 74—99 R **5 Claims**



1. A mechanism for finely adjusting the orientation and/or the position of a payload, the mechanism comprising:

payload support means (**15**; **15*a***);

elastically deformable resilient means (**10**) that are circularly symmetrical in the non-deformed state;

deformation means (**11**) for deforming the resilient means (**10**); and

connection means (**20**; **20*a***) for connecting the payload support means (**15**; **15*a***) to the resilient means (**10**) enabling deformations thereof to be communicated to the payload support means and thus to the payload;

which mechanism is characterized in that:

the resilient means are constituted by at least one continuous ring (**10**) having predetermined radius (R), radial thickness (t), and axial width (a);

the payload support means (**15**; **15*a***) is disposed relative to the ring (**10**) in such a manner as to transform deformation thereof into rotation or into combined rotation and translation of the support means;

the deformation means (**11**) for deforming the ring (**10**) which cause the ring to go from the non-deformed state to the deformed state are suitable for applying an outwardly directed deformation force (F) to said ring simultaneously at two diametrically opposite points (P_M) of the ring (**10**) defining a diametral action line (x—x) of the deformation means (**11**), said ring (**10**) having singular points (P_O) which remain substantially stationary when the ring goes from the non-deformed state to the deformed state with the distributions of the singular points on the ring (**10**) being a function of the orientation of the diametral line of action (x—x) of the deformation means (**11**) relative to a reference diameter of the ring passing through the location of said connection means thereon; and

it further includes means (**14**) for varying the orientation of the diametral action line (x—x) of the ring deformation means (**11**) within predetermined limits, thereby varying the distribution of said substantially fixed points (P_O) of the ring in such a manner that the location of the connection means coincides with varying positions including positions close to and positions distant from said substantially fixed points (P_O) of the ring (**10**), the deformations of the ring corresponding to said positions enabling fine and coarse adjustments respectively of the payload support means (**15**; **15*a***) and thus of the payload.

5,181,431

AUTOMATIC SHIFTING DEVICE OF A MULTI-PATH TOOTHED-WHEEL GEAR CHANGE BOX

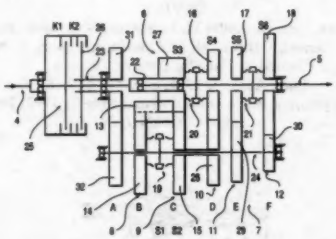
Wolfgang Zaiser, Steinheim; Hans Merkle, Stuttgart; Gerhard Wagner, Remseck, and Gerhard Spengler, Herrenberg, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Oct. 4, 1991, Ser. No. 770,864

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1990, 4031571

Int. Cl.[5] F16H *3/08*

U.S. Cl. 74—333 **12 Claims**



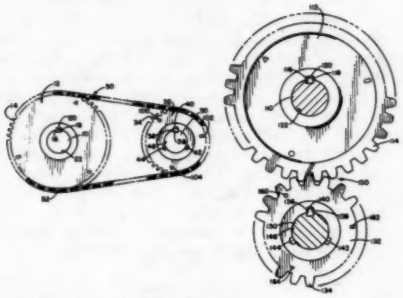
1. An automatic shift device of a multi-path toothed-wheel gear change box having an input shaft and an output shaft configured to be brought into driving connection via at least one of at least two gearbox subunits operatively arranged in parallel to one another in a power transmission path by engaging a respectively operatively associated power-shift clutch, comprising preselectively engageable synchronizing clutches, gearwheel stages operatively associated with the gearbox units having a loose wheel configured to be coupled to its shaft by one of the preselectively engageable synchronizing clutches such that a starting shift condition can be produced in which both the synchronizing clutch of the gearwheel stage for the formation of a reverse gear and the synchronizing clutch of the gearwheel stage for the formation of a lowest of forward gears which is independent of the power-shift clutch of one of the gearbox subunits with the gearwheel stage for the formation of the reverse gear are engaged, and the starting shift condition with engaged synchronizing clutches can be both automatically entered in dependence on a manually actuable selection device and maintained with disengagement of the power-shift clutches when the selection device is moved into a position for interrupting the power transmission path between the input shaft and the output shaft or into a position for interrupting the power transmission path between the input shaft and the output shaft and firmly braking the output shaft.

5,181,432

TIMING GEAR HAVING DIFFERENT KEYWAYS

Timothy R. Allen, Lavaca, Ark., assignor to Cloyes Gear & Products, Willoughby, Ohio

Filed Nov. 26, 1991, Ser. No. 798,122
Int. Cl.[5] F16H *53/04, 1/08, 1/12*
U.S. Cl. 74—395 **20 Claims**



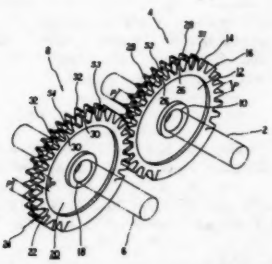
1. A timing gear device comprising:
a first rotatably supported shaft;
a first gear, having a predetermined number of circumferentially spaced teeth, engaged on and carried by said first shaft;
a second rotatably supported shaft spaced from said first shaft;
a second gear, having a predetermined number of circumferentially spaced teeth engaged on and carried by said second shaft;
a means for engaging said first gear and said second gear; and,
a timing means for changing the rotative position of the second shaft and said second gear in relation to said first shaft and said first gear, said timing means comprising:
a single primary keyway in one of said second gear and said second shaft,
a plurality of secondary keyways in another of said second gear and said second shaft, wherein said secondary keyways have differing configurations, and
a key in said primary keyway, said key being engaged in a predetermined one of said secondary keyways.

5,181,433

GEAR

Kiyoshi Ueno, Ichikawa, and Teisuke Bushimata, Tokyo, both of Japan, assignors to Chiba Dies Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 680,935, Apr. 5, 1991, abandoned. This application Jun. 15, 1992, Ser. No. 899,001
Claims priority, application Japan, Sep. 20, 1990, 2-251613
Int. Cl.[5] F16H *55/18*
U.S. Cl. 74—409 **3 Claims**



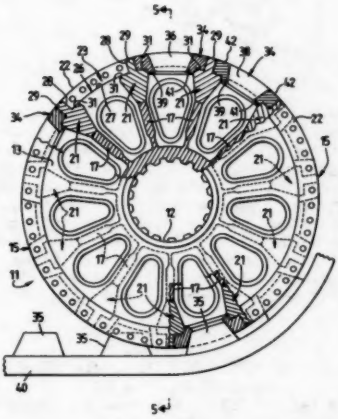
1. A pair of opposed gears meshed intimately with each other, each gear comprising only a single circular gear base having an axis of rotation and a single outer circumferential surface portion, and a double row of teeth fixedly mounted on said single circumferential surface with the thickness dimension of the teeth parallel to the direction of said axis of said gear, said rows of teeth being fixedly positioned adjacent each other, said teeth having an equal dimension in the circumferential direction and being at an equal pitch and being circumferentially offset from the adjacent teeth in the adjacent tooth row.

5,181,434

APPARATUS AND METHOD FOR REFURBISHING A DRIVE TUMBLER

Verlon L. Davis, 1736 Winewood Rd., Birmingham, Ala. 35215

Filed Dec. 6, 1991, Ser. No. 802,851
Int. Cl.[5] F16H *55/12;* B23P *6/00*
U.S. Cl. 74—447 **13 Claims**



1. An improvement in a drive tumbler moving a drive pad wherein said drive pad includes a plurality of drive cleats which are engaged about the circumference of said tumbler, said tumbler including a plurality of radially extending support members mounted on a central hub for connection to a drive mechanism, the improvement comprising:
(a) a circumferential reel member defining a plurality of angularly spaced outwardly facing openings therein said openings having a dimension substantially larger than said drive cleats; and
(b) a plurality of wear members detachably affixed within each of said openings having an outwardly flared opening formed therein for receiving said cleats.

5,181,435

STEERING COLUMN GUIDE ASSEMBLY

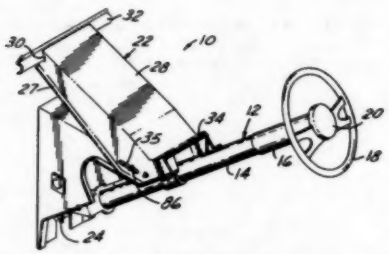
Mustafa A. Khalifa, 10800 S. Morrow Cir., Dearborn, Mich. 48126, and James Chapp, Jr., 5161 Woodrun Ct., West Bloomfield, Mich. 48323

Filed Mar. 30, 1992, Ser. No. 859,784
Int. Cl.[5] B62D *1/18*
U.S. Cl. 74—492 **1 Claim**

1. A steering column guide assembly for a collapsible vehicle steering column, comprising:
an upper support bracket fixed relative to one portion of vehicle support structure;
a lower support bracket secured to another portion of vehicle support structure;
a guide bracket attached to said lower support bracket and means forming an aperture to receive the steering column,

a sleeve bracket adapted to receive the steering column and having a pair of spaced apart flanges, spacers adapted to engage said flanges, and fastening means for fastening said spacers and guide bracket to said lower bracket to attach the steering column to said lower support bracket;

said lower support bracket having a first slot and a first aperture spaced from one end of said first slot, and said upper support bracket having a second slot in adjacent said first aperture and a second aperture spaced from one end of said second slot adjacent said first slot; and



a first bolt having a head disposed on the interior of said lower support bracket and extending through said first slot and said second aperture and having a first nut engaged therewith, and a second bolt having a head disposed on the exterior of said upper support bracket and extending through said second slot and said first aperture and having a second nut engaged therewith for guiding said lower support bracket in a substantially horizontal manner relative to said upper support bracket during a collision type impact which causes the portions of vehicle support structure to move relative to each other.

5,181,436

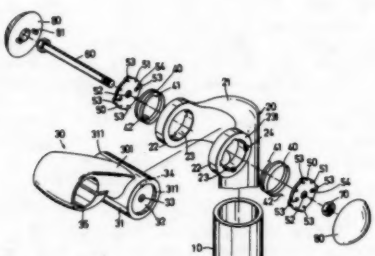
STEM FOR INTERCONNECTING A HANDLEBAR AND A HEAD TUBE OF A BICYCLE

Richard Lai, No. 302-1, Chang-Yuan Rd., Chang-Sha Tsun, Hua-Tan Hsiang, Changhua Hsien, Taiwan

Filed Jun. 15, 1992, Ser. No. 898,304

Int. Cl.[5] B62K *21/14*

U.S. Cl. 74—551.2 **2 Claims**



1. A stem for interconnecting a handlebar and a head tube of a bicycle, said stem comprising an upright tube connected to said head tube and a connecting tube having a first end connected to said handlebar and a second end connected to said upright tube,

the improvement comprising said upright tube having two opposite lug portions extending therefrom, each of said lug portions having a through bore aligned with the through bore of the other one of said lug portions, each of said lug portions having a pair of diametrically opposed notches formed on an outside face of each of said lug portions, said second end of the connecting tube having a cylindrical member with two ends mounted between said two lug portions, each of said ends of said cylindrical member having a positioning hole formed therein, said cylindrical member having an axial through hole aligned with said two through bores of said lug portions, a pair of positioning discs each of which has a pair of diametrically opposed radial projections, said diametrically opposed radial projections respectively engaging said pair of diametrically opposed notches of said two outside faces of said lug portions, each of said positioning discs having a central hole and a plurality of adjusting holes circumferentially formed thereon, two torsional springs each of which is mounted in said through bore of said lug portion between one of said positioning discs and one of the ends of the cylindrical member of the connecting tube, each of said torsional springs having a first end engaging with one of said positioning holes of said cylindrical member and a second end engaging with one of said adjusting holes of one of said positioning discs, a bolt having an end passing through said central holes of said positioning discs, said torsional springs, said through bores of said lug portions and said axial through hole of said cylindrical member and engaging a nut.

5,181,437

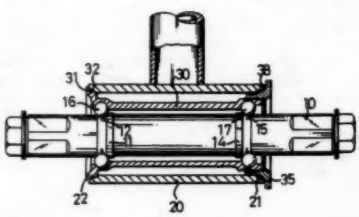
HUB OF A BICYCLE

Yi C. Chi, No. 139-5, An Mei Rd., Mei Shan Village, Hou Li Hsiang, Taichung Hsien, Taiwan

Filed Jul. 13, 1992, Ser. No. 912,771

Int. Cl.[5] G05G *1/14;* **B60B** *35/00;* **F16C** *13/00*

U.S. Cl. 74—594.1 **2 Claims**



1. A hub of a bicycle comprising a hub shell including a first tapered surface formed in a first end portion thereof and a second tapered surface formed in a second end portion thereof, an axle rotatably provided in said hub shell and including a pair of tracks formed on an outer peripheral portion thereof, a bearing engaged on each of said tracks, a tube including two end portions engaged on said bearings respectively and including a cone formed integral on a first end portion thereof and an outer thread formed in a second end portion thereof, said cone including a third tapered surface formed in an outer peripheral portion thereof for engagement with said first tapered surface of said hub shell, and a cap including an inner thread formed therein for threaded engagement with said outer thread of said tube and including a fourth tapered surface formed in an outer peripheral portion thereof for engagement with said second tapered surface of said hub shell, whereby, said hub shell is clamped between said cone and said cap.

5,181,438

BALL LOCK PUNCH RETAINER

Charles G. Wellman, Novi, Mich., assignor to AIP inc., Troy, Mich.

Continuation-in-part of Ser. No. 506,773, Apr. 10, 1990, Pat. No. 5,038,599. This application May 31, 1991, Ser. No. 708,696

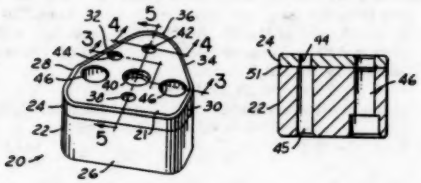
Int. Cl.[5] B21K *5/20*

U.S. Cl. 73—107.1 **11 Claims**

1. A method of forming a punch retainer, comprising the steps of:

(1) permanently connecting a retainer body to a backing plate; and

(2) finally grinding passages within both said retainer body



and said backing plate such that they are properly aligned, and wherein at least one passage formed in said backing plate is smaller than said passage formed in said retainer body.

5,181,439

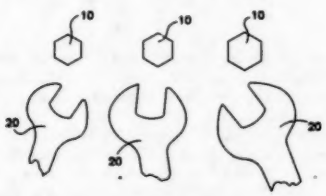
COMMUNICATIVE TOOLS AND FASTENERS

Jimmy R. Schwartz, 1116 Willow Creek, Zachary, La. 70791

Continuation of Ser. No. 227,670, Aug. 2, 1988, abandoned. This application May 3, 1990, Ser. No. 518,484

Int. Cl.[5] B25B *23/02*

U.S. Cl. 81—119 **14 Claims**



1. Articles of manufacture comprising:

(a) a plurality of rotatable fasteners each having a head portion, said fasteners including at least a first fastener of a given kind and a second fastener of the same kind as the first fastener but differing therefrom in that the respective head portions of the first fastener and of the second fastener differ in size from each other; and

(b) a plurality of tools for rotating such fasteners, each such tool having a head-engaging portion of a given size for engaging a fastener head portion of a given size in order to enable such fastener to be rotated by means of the tool, said tools including at least a first tool of a given kind and a second tool of the same kind as the first tool but differing therefrom in that the respective head-engaging portions of the first tool and of the second tool correspond in size to the head size of the first and second fasteners, respectively; at least some of the exterior of the head portion of said first fastener and at least some of the exterior of said first tool each having affixed thereto readily perceptible, visually perceptible matching indicia signifying correspondence of size therebetween, and at least some of the exterior of the head portion of said second fastener and at least some of the exterior of said second tool each having affixed thereto readily perceptible, visually perceptible matching indicia signifying correspondence of size therebetween, said matching indicia affixed to said first fastener and tool being visually distinguishable from said matching indicia affixed to said second fastener and tool.

5,181,440

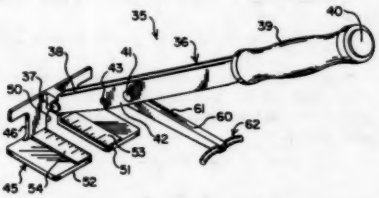
TOOL FOR MEASURING THE TRAVEL OF A VEHICLE BRAKE ROD

Clarence D. Jagt, 201 Hurricane Hill Dr., Nederland, Colo. 80466

Filed Dec. 27, 1991, Ser. No. 815,013

Int. Cl.[5] B25B *25/00*

U.S. Cl. 81—484 **6 Claims**



1. A unitary manually operable tool for use with a vehicle brake assembly that is subject to wear and thus to the need for adjustment thereof, the brake assembly having a brake actuating cylinder and a face wall out of which a generally straight brake rod movably extends, wherein operation of the actuating cylinder to apply vehicle brakes causes the brake rod to move linearly outward from the face wall, as the brake rod moves from a brake-off position to an extended brake-on position, the tool comprising;

a rigid, elongated, member having a first pivot at one end, a manual handle at the opposite end, and a second pivot at a location intermediate said first and second ends,

a rigid L-shaped member mounted to said first pivot, said L-shaped member having a pusher portion configured for engagement with the face wall of the actuating cylinder so as to be spaced from the brake rod, and having a linear scale portion fixed to said pusher portion so as to be positioned generally adjacent and parallel to the brake rod, and

a rigid brake rod operating member having one end mounted to said second pivot, said operating member having a portion spaced from said one end that is configured to cooperate with the vehicle brake assembly so as to cause the brake rod to move from the brake-off position to the extended brake-on position as manual force is applied to said handle, to thereby cause the brake rod to move a distance relative to said scale portion in accordance with the need for adjustment of the vehicle brake assembly.

5,181,441

METHOD FOR SYNCHRONOUSLY INTERLOCKING FEED AXES OF A LATHE

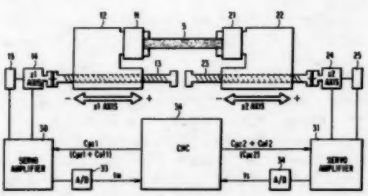
Kiyoshi Okada, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jul. 3, 1991, Ser. No. 725,118

Claims priority, application Japan, Jul. 5, 1990, 2-177865

Int. Cl.[5] B23B *1/00*

U.S. Cl. 82—1.11 **4 Claims**



1. A method of synchronously interlocking first and second opposing headstocks of a lathe coupled to first and second feed axes of said lathe and linked by a workpiece for performing

synchronous interlocking control of said first and second opposing headstocks in accordance with position command data, comprising the steps of:

obtaining a first torque associated with a first motor coupled to said first headstock and a second torque associated with a second motor coupled to said second headstock;

determining offset values of headstock positions attributable to machine or workpiece displacement based only upon a torque difference between said first and said second motors;

converting said torque difference into a distance difference; and

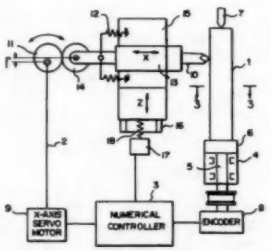
compensating for at least one of said position command data of said first and said second opposing headstocks in accordance with said distance difference obtained in said converting step.

5,181,442

DEVICE FOR MACHINING A NON-CIRCULAR SECTIONED WORKPIECE

Masahiro Nezu, Kamakura, Japan, assignor to Kabushiki Kaisha Shoun Kosakusho, Toyonaka, Japan

Filed Jun. 28, 1990, Ser. No. 545,393
Int. Cl.[5] B23B *5/24, 21/00*
U.S. Cl. 82—19 **2 Claims**



1. A machine tool comprising:

a cutting tool;

means for rotating a workpiece about a first axis;

means for producing an angular position signal responsive to an angular position of said workpiece about said first axis;

said means for producing an angular position signal being an encoder coupled to said workpiece;

a cam follower;

a cam;

spring means urging said cam follower against said cam;

means, responsive to a position of said cam, for displacing said cutting tool along a linear second axis generally at right angles to said first axis;

said means for displacing said cutting tool including a saddle displaceable along said first axis and a slide displaceably carried by said saddle for linear motion along said linear second axis;

said cutting tool being removably carried at a first end of said slide and said cam follower being carried on a second end thereof;

said cam follower including a rotatably mounted wheel;

said cam including an eccentrically mounted disk;

a servo motor for bidirectionally rotating said cam; and

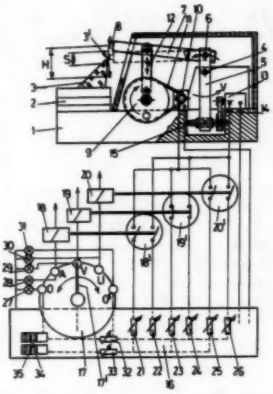
a numerical controller which actuates said servo motor responsive to said angular position signal to rotate said cam in both rotational directions during each revolution of said workpiece within an angular range limited such that the displacement of said cutting tool along said second axis is a substantially linear function of the rotation angle of said cam.

5,181,443

DEVICE FOR CONTROLLING THE DRIVE AND FORWARD FEED OF MICROTOMES, PARTICULARLY ULTRAMICROTOMES

Hellmuth Sitte, Reitherspitzstrasse 166, A-6100 Seefeld, Austria; Helmut Hässig, Am Gedünner 21; Armin Kunz, Uhlandstrasse 19, both of D-6650 Homburg-Saar, Fed. Rep. of Germany, and Klaus Neumann, Eichenstrasse 8, D-6652 Bexbach-Saar 5, Fed. Rep. of Germany

Filed Apr. 10, 1991, Ser. No. 682,955
Claims priority, application Austria, Apr. 11, 1990, 873/90
Int. Cl.[5] G01N *1/06;* B26D *5/20*
U.S. Cl. 83—72 **16 Claims**



1. A control device for controlling the operation of a microtome, particularly an ultramicrotome, wherein a specimen and a knife are relatively moved to cut sections from the specimen, said control device comprising:

a driving motor for moving one of the knife and the specimen at a cutting speed to cut sections from the specimen;

at least one servomotor for advancing at least one of the knife and the specimen toward the other at a rate of feed to regulate the thickness of the section cut from the specimen; and

means for simultaneously changing both the value of said cutting speed produced by said driving motor and the value of said rate of feed produced by said at least one servomotor, said changing means comprising a switching arrangement operatively associated both with said driving motor and with said at least one servomotor and actuatable by a switching element for changing said values.

5,181,444

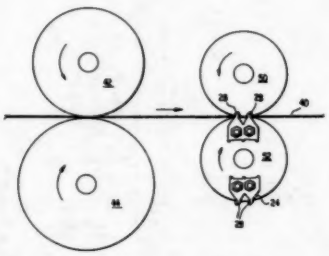
MULTIPLE BARB PICK

John D. Bassett, Kalamazoo, Mich., assignor to International Paper Company, Purchase, N.Y.

Filed Sep. 23, 1991, Ser. No. 763,721
Int. Cl.[5] B26D *7/18*
U.S. Cl. 83—154 **6 Claims**

1. An integral multi-barb pick for removing waste material form a moving paperboard web, the pick formed of a substantially flat sheet metal piece and including a generally rectangular base, said base having two opposite, upwardly extending lateral edges, two generally triangular portions extending upwardly from said base, the apex of each triangular portion having a generally rectangular barb, each triangular portion having a right side and a left side, the left side of each triangular portion meeting a first side of the respective rectangular barb at a first obtuse angle, the right side of each triangular portion meeting a second side of the respective rectangular barb at a second angle, said second angle being less than said

first obtuse angle, a portion of the second side of each barb extending beyond its intersection with the respective right side of the respective triangular portion to define a projection, third



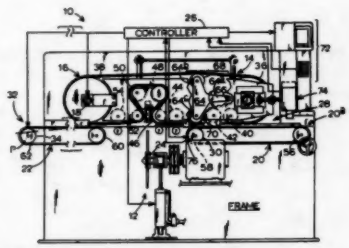
and fourth sides of each rectangular barb being beveled and meeting at an uppermost corner of each respective rectangular barb, the bas provided with means to fasten the pick to a rotatable pick roll.

5,181,445

OPTIMIZING CUTOFF SAW

Leroy E. Cothrell, Gresham, Oreg., assignor to Ultimizer's Inc., Boring, Oreg.

Filed Nov. 15, 1991, Ser. No. 792,610
Int. Cl.[5] B26D *5/20*
U.S. Cl. 83—155 **1 Claim**



1. An improved cutoff saw comprising:

crosscutting means for cutting a board of plural predetermined locations therealong, and

conveyance means for feeding the board past said crosscutting means, said conveyance means including means for starting and stopping the board with the predetermined locations aligned for cutting within said crosscutting means, said conveyance means including a first belt conveyor disposed above the board and in frictional engagement with an upper surface thereof along a substantial lengthwise extent thereof upstream and downstream of said crosscutting means, said first belt conveyor being driven in predefined timing relation with said crosscutting means, said conveyance means further including driven infeed means operatively associated with said first belt conveyor and including a second belt conveyor disposed below the board and in frictional engagement with a lower surface thereof along a substantial lengthwise extent thereof upstream of said crosscutting means;

wherein at least one of said first and second belt conveyors includes a first roller around which a belt of said one belt conveyor travels, said first roller rotating on a shaft urged by leveraging means toward the board to provide gripping engagement with the board between the belts of said first and second belt conveyors; and

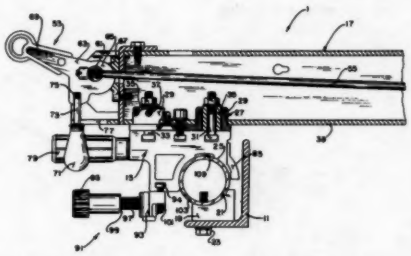
wherein said leveraging means includes a pivotable member mounting said first roller and a second roller, said first and said second rollers engaging a first and a second run of one of said belts of said first and second belt conveyors and being responsive to tension in said one belt to pivot said member.

5,181,446

SELF-ALIGNING QUICK PICK-OFF RIP FENCE

John L. Theising, Florissant, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 23, 1991, Ser. No. 816,342
Int. Cl.[5] B26D *7/01*; B27B *27/02*
U.S. Cl. 83—438 **14 Claims**



5. A self-aligning quick pick-off rip fence for use in a table saw having an upper surface with a rotatable saw blade extending therethrough and front and rear surfaces extending transverse to said upper surface and generally parallel to each other, said rip fence comprising:

elongated front and rear rails mounted to and extending along the front and rear surfaces of said table saw;

an elongated cylindrical guide bar mounted to the front rail along the front surface of the table saw;

a fence head slidably mounted to said elongated cylindrical guide bar, said fence head including an adjustable curvilinear bearing surface for engaging the elongated cylindrical guide bar in clamped relationship;

a fence channel mounted to said fence head at a first end and extending across the upper surface of the table saw in generally parallel alignment with a plane extending through said rotatable saw blade and terminating in a second end, said fence channel supporting a workpiece for rip cutting by said rotatable saw blade;

self-aligning bearing means attached to the second end of said fence channel and being slidably mounted on said rear rail, said self-aligning bearing means being in generally opposed relationship to the adjustable curvilinear bearing surface associated with said fence head;

said self-aligning bearing means when mounted to said rear rail cooperating with the adjustable curvilinear bearing surface of said fence head when engaging said elongated cylindrical guide bar to cause the fence channel to be aligned in substantially squared position relative to said front and rear rails; and

said fence head including said adjustable curvilinear bearing surface engaging said elongated cylindrical guide bar substantially along upper surface areas thereof to facilitate the quick pick-off of the rip fence from the table saw when said fence head is disengaged from said elongated cylindrical guide bar.

5,181,447

ADJUSTABLE PROTECTING GUARD APPARATUS FOR A BLADE OF A TABLE SAW

Timothy Hewitt, P.O. Box 839, Royal Oak, Mich. 48068-0839

Filed Mar. 25, 1991, Ser. No. 674,165
Int. Cl.[5] B27G *19/02*
U.S. Cl. 83—447 **19 Claims**

1. An adjustable protecting guard apparatus for a saw blade of a table saw, comprising:

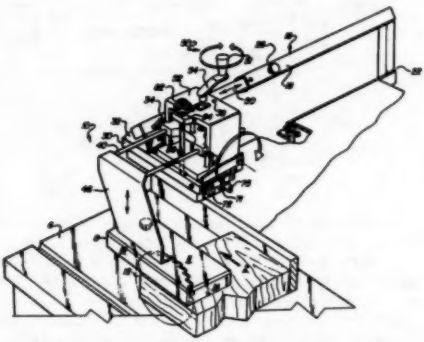
a guard positionable to overlie said saw blade of said table saw;

means for adjustably supporting said guard above said saw blade;

means for pivoting said guard away from said saw blade; and

means for selectively terminating electrical power to a motor rotating said saw blade upon pivoting of said guard away from said blade;

wherein said means for adjustably supporting said guard comprises a telescoping arm, said telescoping arm extending overhead said table saw above a workpiece, said telescoping arm being adjustable to position said guard to overlie said saw blade;



wherein said means for adjustably supporting said guard further comprises a support bracket attached to a free end of said telescoping arm and a guard superstructure attached to said supporting bracket, said guard superstructure including means for controlling the height of said guard with respect to said saw blade;

wherein said guard superstructure further comprises a pair of vertically and horizontally displaceable support arms and a downward-extending support bracket attached to said pair of support arms, said downward-extending support bracket being attached to said guard.

5,181,448

MITER SAW APPARATUS WITH ADJUSTABLE WORKPIECE SUPPORTING FENCE

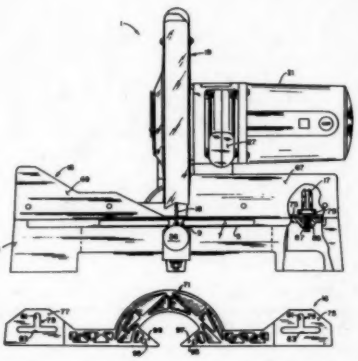
Daniel A. Terpstra, Kirkwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 20, 1991, Ser. No. 811,227

Int. Cl.[5] B27B *27/06*

U.S. Cl. 83—468.3 **22 Claims**

15. The miter saw as defined in claim **14** wherein said longitudinal slot defines a path along which said fence can move between a forward and a rearward position, and each said



fence lock locks said fence in one of said forward and rearward positions.

5,181,449

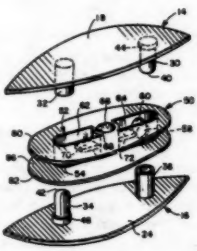
TATTING SHUTTLE WITH DISPOSABLE BOBBIN

Carol M. Winandy, 1295 Des Plaines Ave., P.O. Box 1401, Des Plaines, Ill. 60018

Continuation of Ser. No. 675,283, Mar. 26, 1991, abandoned. This application Aug. 12, 1992, Ser. No. 928,685

Int. Cl.[5] D04C *7/00*

U.S. Cl. 87—58 **6 Claims**



1. A tatting shuttle apparatus having a pair of opposed working ends, comprising:

at least two removable side members;

a bobbin carried between the removable side members, comprising a core wall having opposed, spaced convexly curved portions joined together by generally straight line portions, so as to define a hollow interior cavity, and so as to impart an elongated cross-section to the core wall, the bobbin further having a pair of spaced apart flanges, one flange adjacent each side member, and extending beyond the core wall;

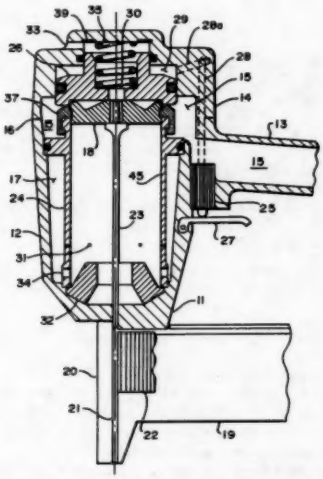
said bobbin further comprising a hollow cylinder for rotatable mounting of the bobbin during winding, which divides said cavity into two portion; and

securement means for removably securing said side members on either side of said bobbin.

5,181,450
PNEUMATIC FASTENER DRIVING APPARATUS WITH PISTON HOLDING DETENT

Umberto Monacelli, via Parini, 6, I-20052 Monza, Italy

Filed May 16, 1991, Ser. No. 701,174
Int. Cl.[5] F15B *15/26*; B25C *1/00*
U.S. Cl. 91—41 6 Claims



1. A pneumatic powered fastener driving apparatus, comprising:

a) a compressed air chamber;

b) a housing for receiving a cylinder having a first inner diameter;

c) a detent affixed to said cylinder and providing an inwardly extending circumferential engaging surface, said inwardly extending circumferential surface having a second inner diameter less than said first inner diameter;

d) a circumferential seal;

e) a piston slidably disposed within said cylinder for reciprocating movement between a first home position and a second remote position, said piston having an outer circumferential surface adapted to engage said inwardly extending circumferential surface of said detent, said outer circumferential surface having a third diameter selected to be sufficiently less than said second inner diameter so that said detent forms a first air tight seal between said cylinder and said piston and to maintain of itself said piston in its first home position;

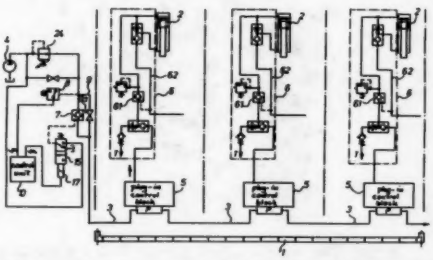
f) a first valve moveable within said housing between a third home position, wherein said circumferential seal, said cylinder and said first valve forms a second air tight seal therebetween, said first and second air tight seals establishing a pocket comprised of said cylinder, said piston and said first moveable valve when said piston is disposed in its first home position and said first moveable valve is disposed in its third home position, and a fourth open position for permitting the flow of compressed air from said chamber to said pocket; and

g) a second valve actuatable for moving said first valve from its third home position towards its fourth open position, whereby the compressed air enters said pocket increasing the pressure of the air therein to a level sufficient to disengage said detent from said piston and thereafter, rapidly moving said piston from its first home position toward its second remote position.

5,181,451
CONTROL SYSTEM FOR LONGWALL FACE SUPPORT FRAMES

Guy Geuns, Wuppertal, and Werner Reinelt, Bochum, both of Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany

Filed Jun. 18, 1991, Ser. No. 716,924
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1990, 4019607
Int. Cl.[5] F01B *1/00*, *7/00*
U.S. Cl. 91—170 MP 7 Claims



1. A control system for longwall face support frames as used in mines, the control system comprising pushing rams adapted to be actuated at two different pressures, namely, one pressure for non-defined cutting and the other pressure for defined cutting, a respective non-return valve arrangement for each pushing ram whereby each ram is individually actuable by its respective non-return valve arrangement, a common pressure line connecting the pushing rams to a hydraulic pressure unit, a further non-return valve arranged to be actuated in dependence on the pressure of the hydraulic pressure unit and disposed in the common pressure line between the hydraulic pressure unit and the pushing rams, and an electronic control unit arranged to actuate the further non-return valve via two-position valve actuated by an electromagnet so that the further non-return valve is closed when the electromagnet drops out.

5,181,452
BELLOWS ACTUATOR

Guy Immega, Vancouver, Canada, assignor to Kinetic Sciences Inc., Vancouver, Canada

Filed Nov. 22, 1991, Ser. No. 796,422
Int. Cl.[5] F15B *11/08*; F01B *19/00*
U.S. Cl. 91—418 7 Claims

1. A bellows actuator, comprising:

at least one bellows chamber;

said bellows chamber comprising at least one hollow enclosure;

said bellows chamber comprising three or more chamber segments arranged around an axis;

each of said chamber segments comprising a radially outwardly extending protrusion;

said protrusion comprising four chamber wall portions;

said four chamber wall portions merging with one another along a pair of first fold lines which extend peripherally of said bellows chamber and a pair of second fold lines which extend radially of said bellows chamber;

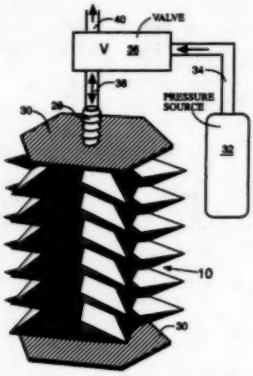
said chamber wall portions of each of said chamber segments merging with respective ones of said wall portions of adjacent ones of said chamber segments along pairs of third fold lines which extend radially of said bellows chamber;

said chamber wall portions of each of said chambers merging with said chamber wall portions of adjacent chambers along pairs of fourth fold lines;

said pairs of fold lines each converging radially outwardly; and

said first, second and third pairs of fold lines meeting at radially outermost apexes of said chamber segments;

said bellows actuator being expansible and contractible along the axis by flexure of said wall portions relative to



one another about said first, second, third and fourth fold lines in response to pressure changes within said bellows chamber; and

means for effecting such pressure changes.

5,181,453

VARIABLE DISPLACEMENT COMPRESSOR

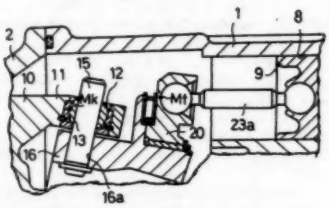
Hiroaki Kayukawa; Kazuya Kimura; Kenji Takenaka, and Takuya Okuno, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Oct. 21, 1991, Ser. No. 780,140

Claims priority, application Japan, Oct. 23, 1990, 2-286675

Int. Cl.[5] F01B *3/00*

U.S. Cl. 92—12.2 **12 Claims**



10. In a variable displacement compressor having a plurality of pistons disposed in a cylinder block, a rotatable drive shaft, a drive plate mounted on the drive shaft such that it rotates integrally with the drive shaft, a rotary journal pivotally coupled to the drive plate such that it rotates together with the drive plate and a swash plate carried by the rotary journal for reciprocally driving the pistons to compress a fluid, the improvement comprising:

a bearing pivotally mounted on the drive plate, the bearing having a guide slot; and

a pin for coupling the drive plate to the rotary journal, the pin being slidably supported by the bearing, the pin and bearing being arranged such that when the rotary journal pivots with respect to the drive plate, the pin slides linearly in the guide slot and said bearing pivots relative to the drive plate.

5,181,454

SYSTEM FOR DECANTING MATERIAL IN TOWER-TYPE MALTHOUSES

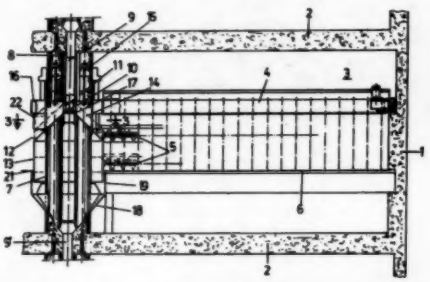
Karl L. Becker, and Francesco Beldevere, both of Madrid, Spain, assignors to Seeger Industrial S.A., Madrid, Spain and Inamex de Cerveza y Malta, S.A. de C.V., Texoco, Mexico

Filed Mar. 27, 1991, Ser. No. 676,766

Claims priority, application Spain, Mar. 30, 1990, 9000922

Int. Cl.[5] C12C *1/14, 1/06*

U.S. Cl. 99—277.2 **9 Claims**



8. In a tower-type malthouse having floorage areas for steeping, germination and/or roasting of a product; each of said floorage areas having a working surface; an arm rotatably mounted for movement about the axis of said malthouse; and means carried by said arm for dispensing or performing selected operations on the product within a floorage area; wherein the improvement comprises;

a plurality of separate vertical columns extending longitudinally within said malthouse, said columns disposed about the axis of said malthouse and collectively defining therebetween a central space extending through the various floorage areas of said malthouse;

a duct disposed in said central space in each of said floorage areas for passage of the product therethrough, said duct having sidewalls, an upper portion and a lower portion;

said lower duct portion having a deflector surface spaced from said sidewalls and connected thereto by corner posts to define therebetween passageways extending radially from said central space to provide communication between said space and the various floorage areas;

said upper duct portion being in communication with an upper floorage area;

a movable plug disposed for axial movement along said plurality of columns from a lower position to an intermediate position and to an upper position, the position of said plug serving to open or close said radially extending passageways;

said plug having an upper conically-shaped section and a body portion extending downwardly therefrom, said upper conically-shaped section formed with a central opening configured to receive the lower portion of said duct;

said plug further having a passageway therethrough, the upper end of said passageway being in communication with the central opening of said plug;

a funnel-shaped member fixedly disposed in said central space about said plurality of columns, said member resembling an inverted cone having an enlarged upper cylindrical section positioned beneath said plug and a lower discharge conduit in communication with a lower floorage area, and said cylindrical section defining a mouth opening of said member; and

elevator means for selectively moving said plug to one of its lower, intermediate or upper positions; whereby:

(1) when said plug is moved to its lower position, the body portion of said plug is received within the cylindrical section of said funnel-shaped member, said dispensing

means is operatively associated with the conically-shaped section of said plug, and said deflector surface of said duct is positioned adjacent to and in substantial alignment with the conically-shaped section of said plug to permit passage of the product from said duct to the working surface of the associated floorage area via said plug;

(2) when said plug is moved to its intermediate position, the body portion of said plug remains received within the cylindrical section of said funnel-shaped member, the lower end of said plug passageway is in communication with the lower discharge conduit of said funnel-shaped member, and the deflector surface and the radially extending passageways of said duct are received within the central opening of said plug and are disposed in communication with the passageway through said plug to permit passage of the product from said duct to the lower floorage area via said plug; and

(3) when said plug is moved to its upper position, said plug is spaced away from said funnel-shaped member to provide communication between the mouth opening of said funnel-shaped member and the associated floorage area, and said dispensing means is operatively associated with the mouth opening of said funnel-shaped member to dispense the product from the working surface of the associated floorage area to the lower floorage area via said funnel-shaped member.

5,181,455

ELECTRIC GRILLING APPLIANCE

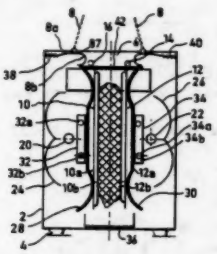
Ruben Masel, Ramat Hasharon, and George Valdshtein, Givat Savyon, both of Israel, assignors to Talbert Ltd., Tel-Aviv, Israel

Filed Dec. 9, 1991, Ser. No. 803,939

Claims priority, application Israel, Dec. 14, 1990, 96665; Jun. 4, 1991, 98359

Int. Cl.[5] A47J *37/08*

U.S. Cl. 99—391 **9 Claims**



1. An electric grilling appliance, comprising: a housing; a pair of infrared radiation emitting heaters disposed within the housing on opposite sides thereof; a food holder disposed within the housing between and spaced from said pair of infrared radiation emitting heaters for holding the food article to be grilled; said food holder including a pair of metal food holder plates of a size and configuration to directly contact, on their inner surfaces, substantially the complete outer surface of the food article to be grilled, the outer surfaces of said metal food holder plates being blackened to absorb the infrared radiation emitted by said heaters; and spring means for urging said metal food holder plates towards each other into firm contact with the food article to be grilled.

5,181,456

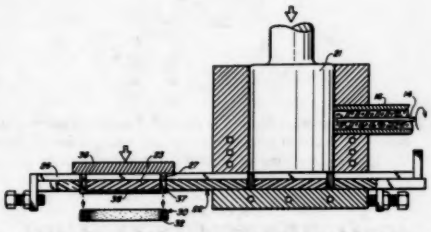
APPARATUS FOR FORMING BINDERLESS EDIBLE PRODUCTS

Ezra Theys, Belmont; Russell G. Taylor, Pleasanton, both of Calif.; Bruce Bertelsen, Rice Lake, Wis.; Albert Oey, San Ramon, Calif.; John Hoyrup, Cupertino, Calif., and Frank Knafelc, Lafayette, Calif., assignors to The Clorox Company, Oakland, Calif.

Division of Ser. No. 735,585, Jul. 25, 1991, Pat. No. 5,128,163, which is a continuation-in-part of Ser. No. 696,807, May 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 523,762, May 16, 1990, abandoned. This application Mar. 6, 1992, Ser. No. 847,117

Int. Cl.[5] A23P *1/00*; B30B *15/00*

U.S. Cl. 99—485 **7 Claims**



1. An apparatus for forming edible products from formable, edible, comminuted material comprising in combination:

(a) a hopper for containing comminuted, edible material and means for chilling said material;

(b) a substantially vertical mold cavity cooperating with said hopper to receive comminuted, edible material, said cavity having an upper inlet opening and a lower outlet opening;

(c) a substantially vertical, movable compression piston mounted for reciprocation within said cavity; means for reciprocating said compression piston between a retracted position when said chamber is being charged with said comminuted material and an extended position when said comminuted material is compressed through said lower outlet into a horizontally retractable sliding block;

(d) said horizontally retractable sliding block having at least one shaped-form cavity formed therethrough cooperating with said lower outlet;

(e) means for horizontally sliding said block to a position exterior to said mold cavity lower outlet; and

(f) means for cooling said sliding block cavity from about −5° F. to about 5° F.; and

(g) means for ejecting frozen, compressed material from the form cavity when said block is positioned exterior to said lower outlet.

5,181,457

SEED PEELING APPARATUS

Iizuka Toshiyuki, 242, Yamate, Naka-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Sep. 12, 1991, Ser. No. 757,938

Claims priority, application Japan, Sep. 25, 1990, 2-254856

Int. Cl.[5] A23N *5/00*

U.S. Cl. 99—514 **12 Claims**

1. A seed peeling apparatus, comprising:

a seed container having a seed inlet opening and means defining a bottom opening;

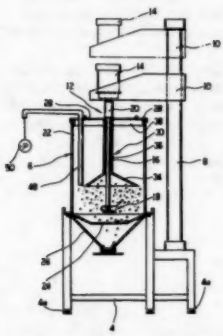
a substantially conical keep plate disposed inside said seed container;

seed agitating means disposed in said seed container for agitating seeds, said seed agitating means having a rotary abrasive member for stirring seeds, said rotary abrasive member having a curved and roughened surface;

a screen means for screen seed cores, said screen means

being attached to said means defining bottom opening of said container; and

a collecting receptacle provided under said screen means;



wherein said seed container is provided with abrasive materials therein, said abrasive materials being selected from the group consisting of silicon carbide and emery.

5,181,458

APPARATUS FOR PRODUCING A VEGETABLE PRODUCT

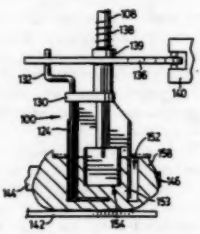
Rex B. Plant, and John P. Marton, both of Hamilton, Canada, assignors to 461844 Ontario Limited, Hamilton, Canada

Division of Ser. No. 354,940, May 22, 1989, Pat. No. 5,060,563. This application Sep. 19, 1991, Ser. No. 762,443

The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.

Int. Cl.[5] A23L *1/212*; A23P *1/00*

U.S. Cl. 99—538 **7 Claims**



1. Apparatus for producing a product of predetermined shape from a vegetable, comprising:

means to cut a cylindrical plug of given depth in the vegetable and to cut a cylindrical pocket in the plug, and drive means therefor;

means to sever the base of the plug to form a cup and to lift the cup from the vegetable and to release the cup from the cutting means.

5,181,459

FRUIT INDENT REMOVAL DEVICE

Raymond E. Camezon, and Klaus Silbermann, both of Danville, Calif., assignors to California Processing Machinery, Danville, Calif.

Continuation-in-part of Ser. No. 666,054, Mar. 7, 1991. This application Jul. 15, 1991, Ser. No. 729,622

Int. Cl.[5] A23N *4/12, 15/02, 15/04, 15/08*

U.S. Cl. 99—546 **21 Claims**

1. A device for removing the stem and blossom portions of fruit comprising:

a. a support for the fruit, said support being capable of selectively holding the stem and blossom portions of the fruit apart from said support, said stem and blossom portions of the fruit being accessible;

b. a first reamer including a first auger having a rotating shaft and means for moving said rotating shaft longitudinally;

c. a second reamer located at a predetermined distance and oppositely from said first reamer, said second reamer including a second auger, said first and second reamers being located adjacent said fruit held on said support and being capable of dressing out said stem and blossom portions of the fruit; and

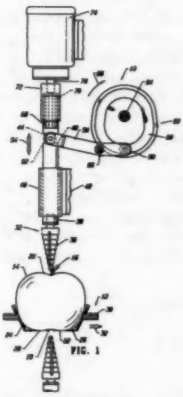


FIG. 1

d. means for causing engagement of said first and second reamers with the fruit by decreasing said predetermined distance between said first and second reamers, said means for causing engagement of said and second reamers including a first flange and a second flange, said first and second flanges being linked to and positioned apart relative said rotating shaft, and spring means spanning said first and second flanges, and said second flange being movable longitudinally with said rotatable shaft, said first flange being longitudinally fixed relative to said rotatable shaft.

5,181,460

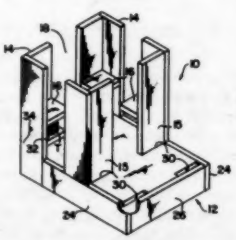
DEVICE FOR BUNDLING SHEET MATERIAL

John Gremelsbacker, 595 Broad Swamp Rd., Cheshire, Conn. 06410

Filed May 10, 1990, Ser. No. 521,365

Int. Cl.[5] B65B *13/18*

U.S. Cl. 100—34 **7 Claims**



1. Device for bundling sheets of material and comprising a generally rectangular support base having horizontally disposed and vertically spaced apart top and bottom walls and vertically disposed connecting walls secured to and extending

around the perimeter of said top and bottom walls, a plurality of vertically elongated guide members, each of said guide members having two vertically extending legs joined together to form a generally L-shaped transverse cross section, said guide members including at least one fixed guide member mounted in stationary position on said support base at one corner thereof and extending upwardly therefrom, said one guide member defining portions of two of said connecting walls, at least two adjustable guide members, one leg of each adjustable guide member having a lower end portion extending downwardly beyond the lower terminal end of the other leg thereof a distance substantially equal to the height dimension of the support base, means for mounting said adjustable guide members in a plurality of mounting positions on said support base and including a plurality of slots in said top wall disposed in vertical registry with corresponding slots in said bottom wall for receiving and complementing said lower end portions of the legs of said adjustable guide members, said adjustable guide members in said mounting positions being horizontally spaced apart relative to each other and to said one fixed guide member, a plurality of horizontally spaced apart shelves carried by said guide members and defining upwardly facing support surfaces disposed within a common generally horizontal plane spaced upwardly from said support base, said guide members and said shelves cooperating to define a generally rectangular upwardly open guide channel for receiving a multiplicity of rectangular sheets of material of one size when said adjustable guide members are mounted in one position on said support base and for receiving a multiplicity of rectangular sheets of material of another size when said adjustable guide members are mounted in another position on said support base, said guide members and said shelves cooperating to collate said sheets of material in generally vertically stacked registry with each other and support the resulting stack of material in vertically spaced relation to said support base with a portion of the lower surface of the lowermost sheet of material in said stack exposed between said shelves.

5,181,461

ROUND BALER STARTER ROLL HAVING EASILY CHANGEABLE SURFACE ELEMENTS FOR MODIFYING THE AGGRESSIVENESS OF THE ROLL

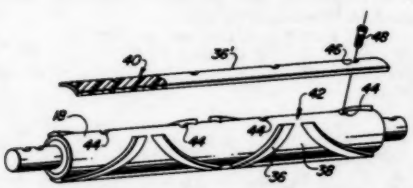
Jean Viaud, Sarreguemines, France, assignor to Deere & Company, Moline, Ill.

Filed May 20, 1991, Ser. No. 702,563

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1990, 4019335

Int. Cl.[5] B30B *5/06*; A01D *39/00*

U.S. Cl. 100—88 **3 Claims**



1. In a baler for forming cylindrical bales from a crop having a bale forming chamber having an inlet wherein there is disposed a bale starter roll including an elongate cylindrical core having a central longitudinal axis and having a plurality of helically arranged ribs permanently fixed thereto at axially spaced locations therealong, the improvement comprising: said ribs being arranged so as to define rib free diametrically opposed areas extending the entire length of, and in parallel relationship to said axis of, the core; and an impeller being releasably secured to said core in covering relationship to substantially all of each of said diametrically opposed areas of said core and having crop engaging surfaces made of a material having wear resistant and friction increasing characteristics whereby the aggressiveness of the roll is enhanced when the impellers are added thereto.

5,181,462

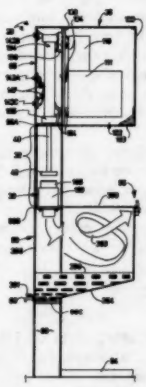
DISPOSAL COMPACTOR FOR AEROSOL CANS

J. Wayne Isaac, Sheridan, Ark., assignor to Aerosol Disposal Systems, Inc., Sheriden, Ark.

Filed May 6, 1991, Ser. No. 696,008

Int. Cl.[5] B30B *9/04, 9/32*

U.S. Cl. 100—98 R **1 Claim**



1. A disposal compactor for crushing used aerosol spray cans and the like of the type having a nozzle and an output neck and environmentally safely recovering their residual contents, said compactor comprising:

vertically upright frame means adapted to be disposed upon a supporting surface for mounting said compactor;

rigid, telescoping receiver means operationally mounted within said frame means for receiving an inverted can to be processed;

fluid holding tank means in fluid flow communication with said receiver means for receiving waste fluids ultimately liberated from said can;

crusher means secured to said frame means for activating said receiver means by first contacting said can and forcibly moving it downwardly against said receiver means and thereafter compressing said receiver means during operation of said compactor, said crusher means comprising:

a hydraulic cylinder operatively disposed in said frame means above said receiver means, said hydraulic cylinder axially aligned with said receiver means;

ram means driven by and projecting downwardly from said hydraulic cylinder toward said receiver means; and,

platen means secured to said ram means for engaging a bottom flange of said can to drive it downwardly said platen means comprising a recess for mating with said can; and,

wherein said receiver means comprises:

tubular, stationary sleeve means for securing said receiver means to said frame means, said sleeve means comprising a top and a bottom;

tubular cylinder means coaxially, slidably disposed within said sleeve means and reciprocally movable a limited distance therewithin for first receiving a can to be processed, said tubular cylinder means comprising a shoulder portion adapted to mate with an upper flange of said can;

tubular union means coaxialy, fixedly disposed within said

sleeve means at said bottom for limiting travel of said tubular cylinder means, said union means comprising a head and an exhaust pipe integral with said head and extending downwardly through said receiver means, said union head and exhaust pipe defining a bore providing fluid flow communication between said receiver means and said tank means;

valve means normally occluding said exhaust pipe but displaceable by can contact for opening said exhaust pipe to vent fluids to said fluid holding tank means;

valve guide means disposed within said union means for mounting said valve means, said valve guide means having a thickness less than said bore for preserving fluid flow communication, said valve guide means comprising upwardly projecting lance means adjacent said valve for puncturing the neck of said can after predetermined movement of said tubular cylinder means downwardly within said sleeve means, and valve return spring means for normally biasing said valve means closed;

an adjustable, tubular receptacle secured to said valve adjacent said lance for receiving the nozzle of an aerosol can to be processed and for preventing said nozzle from being actuated during can movement; and,

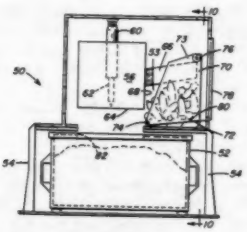
cylinder return spring means for normally biasing said tubular cylinder means upwardly within said sleeve means.

5,181,463

INTEGRATED PRECOMPACTING TRASH COMPACTOR

Raymond F. Lackner, Pittsburgh, Pa., assignor to M. Glosser & Sons, Inc., Johnstown, Pa.

Filed Sep. 12, 1991, Ser. No. 757,952
Int. Cl.[5] B30B *7/00*
U.S. Cl. 100—137 **15 Claims**



1. A trash compactor comprising:

a rigid main compacting and storage chamber;

an auxiliary precompacting chamber that is in unrestricted communication with said main compacting and storage chamber except when communication is blocked by a compacting ram;

a compacting ram having a first portion that compacts material within said main compacting and storage chamber, a second portion that compacts material within said auxiliary precompacting chamber and a third portion that blocks entry from said auxiliary precompacting chamber to said main compacting and storage chamber while said ram is compacting material in said auxiliary precompacting chamber;

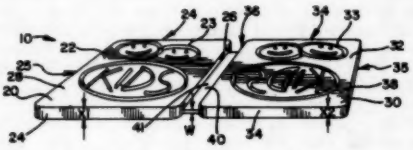
means to reciprocate said ram relative to said main and auxiliary chambers to first compact material within said chambers when said ram is moving in a first direction and to thereafter permit unrestricted ingress of precompacted material from said auxiliary precompacting chamber to said main compacting and storage chamber after material is precompacted in said auxiliary precompacting chamber and said ram is retracted in a direction opposite to said first direction.

5,181,464

UNITARY PAPER IMPRESSION DEVICE

Marvin G. Kuhlman, Des Plaines; Daniel J. Finkiewicz, Elk Grove Village, and Raymond J. Gradecki, Mundelein, all of Ill., assignors to NCM International, Inc., Arlington Heights, Ill.

Continuation of Ser. No. 508,049, Apr. 10, 1990, Pat. No. 5,054,389. This application Aug. 23, 1991, Ser. No. 749,289
The portion of the term of this patent subsequent to Oct. 8, 2008, has been disclaimed.
Int. Cl.[5] B31F *1/07*
U.S. Cl. 101—28 **11 Claims**



1. A unitary impression device consisting of:

a first embossing section having a contacting face surface and an opposite back surface, said face surface being a face plane with at least one outwardly-extending projection therefrom;

a second embossing section having a contacting face surface and an opposite back surface, said face surface being a face plane with at least one complimentary inwardly-extending trough therein for receiving each said projection of said first embossing section; and,

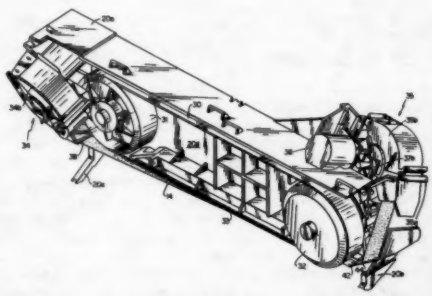
a bendable web with at least one generally linear permanent hinge formed therein contiguous with said back surfaces for hingedly connecting said two embossing sections, means enabling said embossing sections to be repeatably movable between a first position and a second position without additional structure for realignment, in said first position said back surfaces of said embossing sections face substantially the same direction and in said second position said respective face surfaces of said embossing sections mate to impress a content placed therebetween, said embossing sections normally moving from said first position to said second position to provide an impression.

5,181,465

RIBBON GUIDE SYSTEM FOR A LINE PRINTER

Patrick J. Fitzgibbons, Newark Valley, N.Y.; Ho C. Lee, Endicott, N.Y.; Lawrence A. Stone, Cary, N.C., and Paul C. Van Note, Johnson City, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1992, Ser. No. 845,403
Int. Cl.[5] B41J *27/00*
U.S. Cl. 101—103 **12 Claims**



1. In a printer apparatus having a print mechanism compris-

ing a row of print hammers, a type carrier drive and an endless type carrier having a portion extending parallel with said row of hammers with a gap therebetween sufficient for passage of a print medium including an ink ribbon therebetween, the combination comprising

a frame member for supporting said type carrier drive with said parallel portion of said type carrier in alignment with said row of print hammers, and

a ribbon drive mounted on said frame member for feeding a strip of ribbon lengthwise between said portion of said type carrier and said print hammers comprising

a pair of ribbon spools with a length of ribbon wound thereon,

a spool housing means mounted on each end of said frame member, each of said spool housing means having a housing member for rotatably supporting one of said spools and a hinged member connected to said housing member for movement between open and closed positions, and

a ribbon guide system comprising a first ribbon guide means mounted on said frame member proximate one of said spool housing means for positioning said ribbon at one end of said type carrier and a second ribbon guide means movable with said hinged member of a second spool housing means for catching and positioning said ribbon at the other end of said type carrier when moved from said open to said closed positions.

5,181,466

OFFSET PRINTING MACHINE HAVING AUTOMATICALLY RELEASABLY CLAMPED BLANKET SHEET

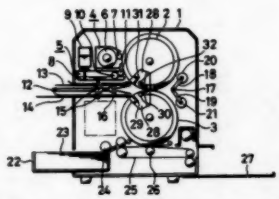
Yoshiaki Ono, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1992, Ser. No. 858,874

Claims priority, application Japan, Mar. 29, 1991, 3-65790

Int. Cl.[5] B41F *9/00*; B41L *47/14*

U.S. Cl. 101—142 **9 Claims**



9. A method for mounting and dismounting a blanket sheet upon a blanket cylinder in an offset printing machine comprising:

providing a blanket cylinder clamp means for automatically clamping and unclamping opposite ends of a blanket sheet;

feeding a blanket sheet to said blanket cylinder and automatically clamping one end thereof;

continuing feeding of said blanket sheet until the blanket sheet is disposed about the blanket cylinder and then automatically clamping the other end of the blanket sheet; and

after a printing operation, automatically releasing an end of the blanket sheet and feeding said sheet into a discharge passageway adjacent to said blanket cylinder;

the method further including providing clamping means for automatically clamping and releasing a master on a master cylinder, and unclamping the master sheet substantially at the same time as the blanket sheet such that said blanket sheet and master have inked surfaces facing each other; and

discharging said master and blanket sheets through said discharge passageway with their inked surfaces facing each other.

5,181,467

AUTOMATIC DAMPENING WATER REPLENISHER

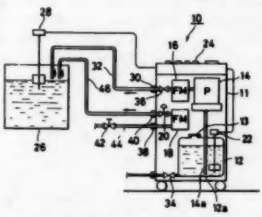
Tomoaki Takekoshi, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 24, 1991, Ser. No. 645,446

Claims priority, application Japan, Jan. 26, 1990, 2-006483[U]

Int. Cl.[5] B41L *25/00*

U.S. Cl. 101—147 **9 Claims**



1. An automatic dampening water replenisher for an offset printing press comprising:

a first tank for storing a stock solution;

a second tank for storing dampening water;

a pump for transferring said stock solution from said first tank to said second tank;

a first flow rate sensor for measuring a flow rate of said stock solution being fed from said first tank to said second tank by said pump;

a second flow rate sensor for measuring a flow rate of diluent water being supplied to said second tank;

a solenoid valve for controlling a flow of said diluent water into said second tank of dampening water;

first and second level sensors for respectively detecting a level of said stock solution in said first tank and a level of said dampening water in said second tank; and

a control means, responsive to outputs of said first and second flow rate sensors and said first and second level sensors, for controlling a feed rate of said stock solution pump and an input flow of said diluent water through said solenoid valve so that the concentration of said dampening water in said second tank is maintained within a predetermined range.

5,181,468

PRETENSIONED JACK FOR CONTROLLING THE OPERATING PRESSURE BETWEEN TWO ROTARY CYLINDERS

Edouard Borel, Corcelles-Sur Chavornay, Switzerland, assignor to Bobst SA, Switzerland

Filed Apr. 23, 1991, Ser. No. 689,481

Claims priority, application Switzerland, Apr. 26, 1990, 1419/90

Int. Cl.[5] B41F *7/04*; F15B *15/00*

U.S. Cl. 101—216 **6 Claims**

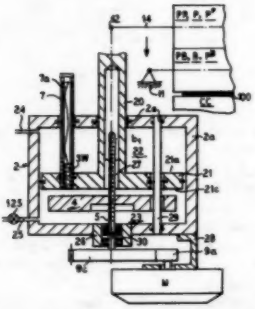
1. A device for controlling operating pressure between two rotary interactive cylinders to be used in a machine processing layers such as ink films, webs, or the like positioned at a contact line between the cylinders, comprising:

at least one of the two cylinders being supported by a central shaft and a movable bearing means supporting an end of the central shaft;

a pneumatic jack comprising a pressure tight sleeve and a movable piston therein with an outlet rod connected to act on and change a position of said movable bearing means, a pressure tight chamber means formed within the sleeve which can be pressurized for applying a pressure which will act on a first side of said piston in a direction opposing a change of position of the movable bearing means in a direction which would result in an increase of a distance and a resulting decrease of pressure at the contact line between the two cylinders;

an arresting piece means which can be selectively positioned to abut against the piston for preventing the movable bearing means from shifting in a direction which would result in a reduction of a predetermined distance and an increase of pressure at the contact line between the two cylinders;

the jack having a pressure chamber positioned at a second side of the piston which is opposite the first side, and wherein said arresting piece means is fitted inside the chamber on a threaded rod, said arresting piece means rotatably engaging the threaded rod such that by rotating the threaded rod, a position of the arresting piece means relative to the piston is adjustable;



a motor means and incremental angular decoder means being provided for driving and controlling the threaded rod so as to rotate it for precisely positioning the arresting piece means; and

a first end of the threaded rod being received within a bearing means for permitting rotation of the threaded rod, said bearing means being located at an end wall of the sleeve of the jack, a toothed wheel attached at said first end of the threaded rod, means for connecting the toothed wheel for rotary drive to the motor means, a second end of the threaded rod being freely received within a hollow anterior of the outlet rod connected to the piston, and the motor means and said incremental decoder means being mounted to the sleeve.

5,181,469

CLAMPING AND TENSIONING DEVICE

Gerd Merkel, Dielheim; Wilfried Vogt, Walldorf; Georg Glaunsinger, Meckesheim; Peter Stadler; Claus-Peter Zander, both of Heidelberg; Jürgen Maass; Gernot Schmitt, both of Wiesloch; Thomas Necker, Sandhausen, and Willi Becker, Bammental, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

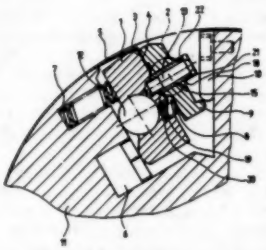
Filed Dec. 31, 1991, Ser. No. 815,419

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1990, 4042293; Apr. 9, 1991, 4111453; Aug. 31, 1991, 4128994

Int. Cl.[5] B41F *27/06, 27/12, 7/22*

U.S. Cl. 101—415.1 **27 Claims**

1. Clamping and tensioning device for clamping a printing plate on a cylinder of a printing machine, comprising a tensioning bar and a clamping bar having substantially radially extending, mutually opposing clamping surfaces for gripping therebetween a bent end of a printing plate, said tensioning bar being formed as a pivotal double lever, tension spring means engageable with said tensioning bar for applying a tensioning force thereto in a tensioning direction, adjusting means engageable with said tensioning bar and actuatable for pivoting said tensioning bar against the tensioning force applied by said tension spring means, said clamping bar being formed as a pivotal double lever connected to said tensioning bar, clamping spring means engaging with said clamping bar for pressing said clamping surface of said clamping bar against the corresponding clamping surface of said tensioning bar with a clamping force for holding a printing plate therebetween, said clamping bar being further formed with a holding element, a fixed stop



cooperatively engageable by said holding element for pivoting said clamping bar against the force of said clamping spring means when said adjusting means are actuated.

5,181,470

INKING UNIT WASHING ASSEMBLY

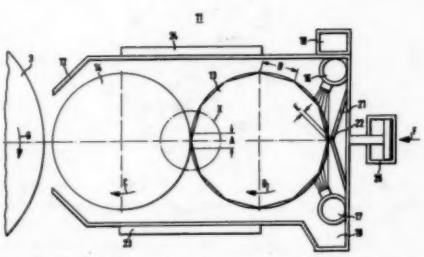
Claus D. Barrois, Erlenbach, and Philipp A. Dieterich, Randersacker, both of Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Jun. 25, 1992, Ser. No. 904,031

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1991, 4121017

Int. Cl.[5] B41F *35/04, 31/20*

U.S. Cl. 101—425 **9 Claims**



1. An inking unit washing assembly which is usable to remove ink residue and other contaminants from an ink distribution drum of an inking system for a printing press, said inking unit washing assembly comprising:

a housing supported for movement on the printing press;

a first polygonal roller and a second rubber roller supported for rotation in said housing, said first and second rollers being generally parallel and in contact with each other, said first polygonal roller having a plurality of axially extending flat surfaces, said plurality of flat surfaces being twisted with respect to the axis of rotation of said first polygonal roller;

means to move said housing with respect to said ink distribution drum to be cleaned to engage said second roller with said ink distributor drum to be cleaned; and

means to supply a washing solution to said first polygonal roller and to remove said washing solution and entrained contaminants from said first, polygonal roller.

5,181,471

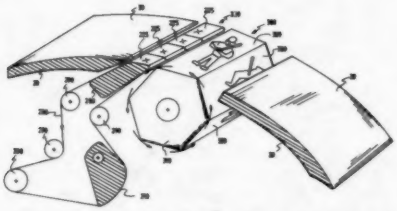
COMBINED OFFSET AND FLEXOGRAPHIC PRINTING AND DECORATING SYSTEM

Ian Sillars, 732 12th St., Manhattan Beach, Calif. 90266

Continuation-in-part of Ser. No. 444,274, Dec. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 142,155, Jan. 11, 1988, Pat. No. 4,884,504. This application Nov. 21, 1990, Ser. No. 616,535

Int. Cl.[5] B41F *17/22*

U.S. Cl. 101—483 13 Claims



1. A method of simultaneously transferring multiple colored images onto cylindrical objects in a decorating press having a blanket cylinder comprising at least one peripheral printing face with a flexographic printing region comprising engraved patterns and an integral offset printing region comprising the steps of:

applying a first pattern of ink to said offset printing region, said first pattern comprising multiple colors;

applying a second pattern of ink to said flexographic printing region;

rotating a first cylinder against said blanket cylinder such that a portion of said first pattern is transferred from said offset printing region of said peripheral printing face to the cylinder and a portion of the engraved pattern of said flexographic region of said peripheral printing face is transferred to the cylinder.

5,181,472

DEVICE FOR THE SUBSTITUTION OF THE RAILS OF RAILWAY TRACKS

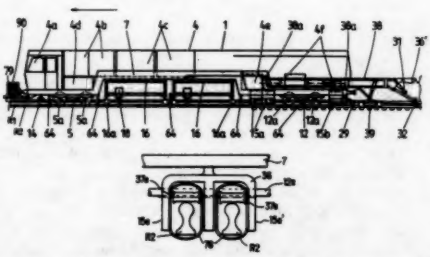
Antoine P. Scheuchzer, Epalinges, Switzerland, assignor to Les Fils d'Auguste Scheuchzer S.A., Lausanne, Switzerland

Filed Jul. 9, 1991, Ser. No. 727,600

Claims priority, application Switzerland, Jul. 13, 1990, 2351/90; Jun. 25, 1991, 1868/91

Int. Cl.[5] E01B *29/02*

U.S. Cl. 104—2 11 Claims



1. Device for the continuous substitution of the rails of railway tracks, comprising:

a train composed of a welding vehicle and a heating vehicle, both running on old rails with said welding vehicle running before said heating vehicle, and an assembly vehicle running on new rails;

(A) wherein said welding vehicle includes:

(1) means for positioning the new rails to be welded and previously brought to the site between the old rails,

(2) at least one welding unit for welding the adjacent ends of the new rails which pass below the axles of said welding vehicle, and

(3) a grinding unit,

wherein said means for positioning said at least one welding unit and said grinding unit are installed between leading and rear bogies of the welding vehicle;

(B) wherein said heating vehicle includes:

(1) at least one heating tunnel for each new rail, equipped with a facility for induction heating, said tunnel being traversed continuously be the new rail during the advance of the train in order to neutralize said new rail, said heating tunnel being located between the old rails and below the body of the heating vehicle, the new rails passing below the axles and between the wheels of said heating vehicle;

(2) means for measuring and controlling the temperature of the new rails;

(3) means for gripping the new rails to introduce them into said tunnel;

(4) stations for releasing the old rails from sleepers, said stations being installed between bogies of said heating vehicle; and

(5) means for guiding the old rails that are detached; and

(C) wherein said assembly vehicle running on the new rails laid upon the sleepers includes:

(1) means for guiding and for laying the new rails on the sleepers, said means being disposed at a front end of said assembly vehicle, and

(2) working stations for fastening to the sleepers the new rails brought to the desired temperature.

5,181,473

RAIL VEHICLE BOGEY WITH INDEPENDENT MOTORIZED WHEELS

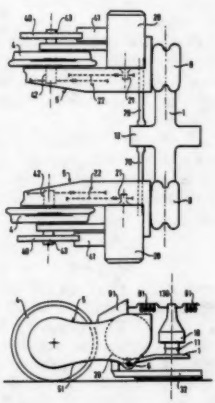
Jean-Michel Petit, Le Pre St Gervais, and Alain Devallez, Raismes, both of France, assignors to GEC Alsthom SA, Paris, France

Filed Jul. 5, 1991, Ser. No. 726,095

Claims priority, application France, Jul. 5, 1990, 90 08545

Int. Cl.[5] B61C *17/00*

U.S. Cl. 105—133 13 Claims



1. In a rail vehicle bogey comprising independently motorized wheels, a transverse chassis carrying a body of a vehicle, arms hinged to the chassis by means of hinges connecting the wheels to the chassis, each said arm supporting a traction

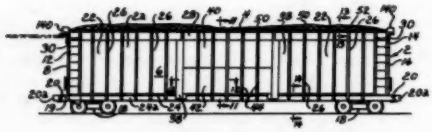
motor, the improvement further comprising each said traction motor having an axis offset relative to the axis of the wheel which is driven by said traction motor, and each said arm constituting a transmission housing between the traction motor supported by said arm and a corresponding independently motorized wheel.

5,181,474

WOOD CHIP RAILWAY CAR CONSTRUCTED BY CONVERTING A STANDARD BOX CAR AND METHOD OF CONVERSION

Roy W. Miller, 2540 Clough St., Highland, Ind. 46322

Filed Apr. 29, 1991, Ser. No. 692,950
Int. Cl.[5] B61D *17/04, 17/06, 39/00*
U.S. Cl. 105—355 **19 Claims**



1. An open top rail car for hauling particulate material comprising

a body being carried by a pair of truck assemblies and having a pair of opposed sidewalls, an end wall, a floor and an open end,

door means being pivotally mounted on said body at an upper portion and closing said open end in a closed position,

said door means being swingable from said closed position to a raised position for opening said open end for unloading,

said body having an open top for receiving a load to be transported,

said body includes an end sill mounted beneath said door means,

said end sill having a flat horizontal projecting ledge for engaging a bridge element for an unloading vehicle.

hinge means affixed to said body and being pivotally connected to said door means at an upper portion of said door means,

said hinge means includes a plurality of hinges having a respective hinge pin, said hinge pins being disposed along a common horizontal axis for mounting said door means for swinging movement,

said hinge means is attached to a header means positioned above said door means,

net means operatively connected to said body adjacent said open top, said net means being arranged to selectively cover said open top,

trough means provided adjacent said wall and said open end, said trough means for storing said net means, and

lock means for selectively engaging said projecting ledge and said door means for locking said door means in a closed position.

5,181,475

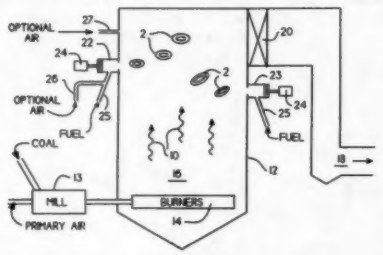
APPARATUS AND PROCESS FOR CONTROL OF NITRIC OXIDE EMISSIONS FROM COMBUSTION DEVICES USING VORTEX RINGS AND THE LIKE

Bernard P. Breen, Pittsburgh, Pa., and James E. Gabrielson, Plymouth, Minn., assignors to Consolidated Natural Gas Service Company, Inc., Pittsburgh, Pa.

Filed Feb. 3, 1992, Ser. No. 829,430
Int. Cl.[5] F23D *11/00, 15/00*
U.S. Cl. 110—345 **22 Claims**

1. An improved apparatus for reducing nitrogen oxide in the flue gas of a furnace wherein a fuel is burned in a primary combustion zone and produces a flue gas containing nitrogen oxide wherein the improvement comprises:

means forming at least one vortex generator attached to the furnace above the primary combustion zone for generating and injecting into the flue gas a series of vortices which vortices are comprised of a fluid selected from the group of fluids consisting of natural gas, C_xH_y compounds, and $C_xH_yO_z$ compounds.

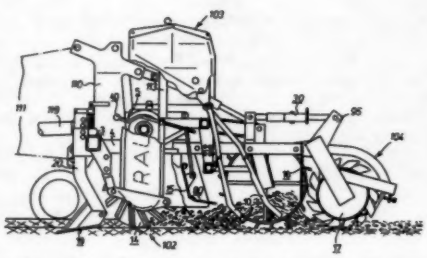


5,181,476

EQUIPMENT SYSTEM FOR AGRICULTURAL GROUND SOIL PREPARATION

Willy Rau, Kirchheim; Wolfgang Rau, Holzmaden, and Christian Taus, Kirchheim, all of Fed. Rep. of Germany, assignors to Firma Maschinenfabrik Rau GmbH, Fed. Rep. of Germany

PCT No. PCT/EP88/00158, § 371 Date Nov. 7, 1989, § 102(e) Date Nov. 7, 1989, PCT Pub. No. WO88/06399, PCT Pub. Date Sep. 7, 1988
PCT Filed Mar. 3, 1988, Ser. No. 423,405
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 8703393[U]; Sep. 3, 1987, 8711912[U]; Nov. 19, 1987, 8715345[U]
Int. Cl.[5] A01B *49/06*
U.S. Cl. 111—60 **13 Claims**



1. An equipment system for agricultural ground soil preparation, comprising:

a vertically adjustable frame unit, having a trestle-type frame part including a bearing frame for coupling the frame unit to a traction vehicle by a lifting rod assembly or a three-point rod assembly and including a supporting frame, the trestle-type frame part being fixedly arranged at an undercarriage with support wheels;

a rotary device with dovetailing prongs, driven by a power take-off shaft, for producing a soil stream, having a bearing frame with receiving parts for coupling the rotary device to the frame unit, wherein the bearing frame of the rotary device is locked without play in all directions with respect to the frame unit;

a sowing machine with vertically adjustable seed delivery pipes adapted to be mounted behind one another in two rows which follow one another in transverse direction, for delivering seeds into the soil stream produced by the

rotary device, having a bearing frame adapted for mounting behind the rotary device, and also being adapted for mounting to the bearing frame of the frame unit;

a clod breaker, having a bearing frame which is adapted to be mounted on either the bearing frame of the frame unit, the bearing frame of the rotary device via separate connecting points on the bearing frame of rotary device, or on the bearing frame of the sowing machine, and which can be pivotably adjusted around a transverse axis;

vertically adjustable plow accessories, adapted to be mounted on the undercarriage of the frame unit or in front of the rotary device; and

a mat-type curtain for guiding the soil stream to the ground behind the seed delivery pipes.

5,181,477

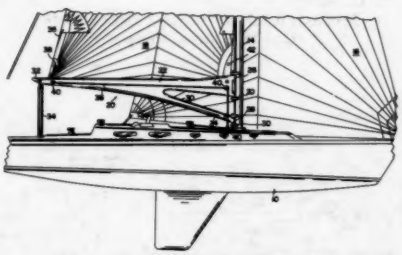
BOOM FOR SAILING VESSEL

Olaf T. Harken, Pewaukee, Wis.; Eric R. D. Hall, Bristol, and S. Dirk Kramers, Tiverton, both of R.I., assignors to Harken, Inc., Pewaukee, Wis.

Continuation of Ser. No. 577,885, Sep. 5, 1990, abandoned. This application Feb. 13, 1992, Ser. No. 836,191

Int. Cl.[5] B63B *35/00*

U.S. Cl. 114—39.1 **11 Claims**



1. In a sailing vessel having an upright member for supporting a boom for a sail, the improvement wherein said boom comprises an elongate member extending rearwardly and generally horizontally from the upright member and terminating at a free end, first hinge means for connecting the forward end of said elongated member to said upright member, an elongate leg extending forwardly and downwardly from said elongate member to a point generally vertically aligned with the forward end of the elongate member, said leg being integral with said elongate member, and second hinge means for connecting said leg to said upright support at a location spaced from said first hinge means, at least one of said hinge means permitting rotation of said boom only in a substantially fixed horizontal plane.

5,181,478

AMPHIBIOUS VEHICLE WITH RETRACTABLE WHEELS

Sebastiano Berardi, 2805, Place de Manseau, Laval, Québec, Canada H7E 5G1

Filed Dec. 23, 1991, Ser. No. 812,018

Int. Cl.[5] B63C *35/34*

U.S. Cl. 114—270 **19 Claims**

1. An amphibious vehicle comprising:

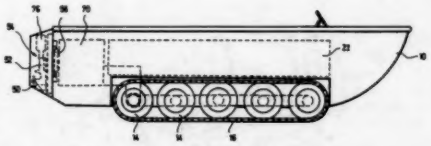
(a) a buoyant hull having two sides and a bottom, each of said two sides being provided with an enclosure having a side opening in one of said sides for storing a ground traction means able to revolve through said side opening, while said vehicle is in water, between a retracted position and a ground engaging position about a longitudinal axis, each of said side opening being coverable by a side hatch panel, said hull having hydrodynamic side surfaces when said hatch panels cover said openings,

(b) a means to move said hatch panels between a covered or uncovered position;

(c) a water propulsion means for propelling and steering said vehicle in water;

(d) a ground propelling means comprising:

a means to drive said ground traction means,



a means to revolve each of said ground traction means between said position inside said enclosure in said hull and a ground engaging position for land cruising,

a means to lock said ground traction means in said ground engaging position for land cruising, and

a means to steer said vehicle on land.

5,181,479

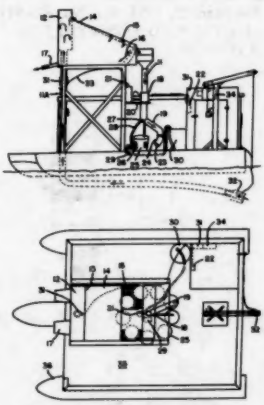
FISH EGG AND LARVAE COLLECTION SYSTEM

Steven D. Hiebert, Golden, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 7, 1992, Ser. No. 832,833

Int. Cl.[5] A01K *61/00*; A01D *44/00*

U.S. Cl. 119—3 **8 Claims**



1. A system for the collection and preservation of fish eggs and larvae samples comprising:

means for continuously passing water containing fish eggs and larvae into an energy dissipator,

means for distributing said water into sheet flow,

means for dewatering and retaining said fish eggs and larvae samples,

means for diverting said samples into a plurality of sample collection means, and

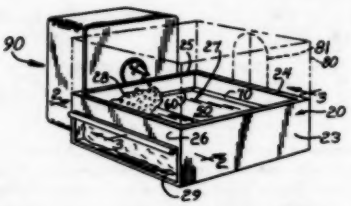
means for preserving said samples.

5,181,480

LITTER-BOX AND LITTER DISPENSING HOPPER

Sheila Dabolt, 26502 Calle San Francisco, San Juan Capistrano, Calif. 92675

Filed Dec. 13, 1991, Ser. No. 806,209
Int. Cl.[5] A01K *1/00, 29/00*
U.S. Cl. 119—165 **19 Claims**



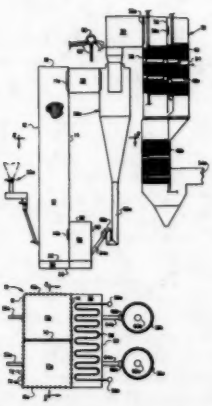
1. In combination, a pet litter-box comprising a bed adapted to receive and store litter and a plurality of interconnected upstanding side walls; a flexible, disposable litter refuse container beneath said bed; and a portably, free-standing litter dispensing hopper having an upright front wall with a central dispensing aperture and a horizontal side wall upon which said hopper may be set remote from said litter box for storage or disposed adjacent said litter box for dispensing litter over sad upstanding side wall and onto said bed of said litter-box, said litter-box further comprising: a floor having a manually retractable section at least partially defining said bed and covering said refuse container; and means attached to one of said side walls for removing litter from the upper surface of said retractable section into said refuse container when said section is retracted.

5,181,481

FLUIDIZED BED COMBUSTION SYSTEM AND METHOD HAVING MULTIPLE FURNACE SECTIONS

David H. Dietz, Hampton, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Mar. 25, 1991, Ser. No. 673,919
Int. Cl.[5] F23D *1/00*; **F23G** *5/00*
U.S. Cl. 122—4 D **24 Claims**



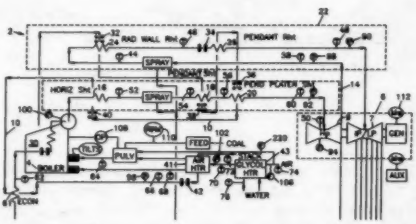
1. A fluidized bed combustion system comprising an enclosure, partition means disposed in said enclosure and dividing said enclosure into a plurality of sections, means for introducing particulate material including fuel to said enclosure, grate means disposed in each of said sections for supporting said particulate material, means for introducing air through said grate means and into said particulate material for fluidizing said particulate material to form a relatively dense region of said particulate material in the lower portion of each of said sections, a region of decreasing density in the middle portion of each of said sections and a substantially constant and low density region in the upper portion of each of said sections, at least one opening extending through the lower portion of said partition means adjacent said dense regions for permitting said particulate material to flow between said sections to equalize the height of said particulate material in said sections and at least one opening extending through the upper portion of said partition means adjacent said low density regions for equalizing the pressure between said sections.

5,181,482

SOOTBLOWING ADVISOR AND AUTOMATION SYSTEM

Donald E. Labbe, Woburn, Mass.; Lawrence J. Line, Davis, W. Va.; Christopher T. Geary, Sudbury, Mass.; Mark C. Leigh, Richmond, Va., and John M. Donohue, Malden, Mass., assignors to Stone & Webster Engineering Corp., Boston, Mass., a part interest

Filed Dec. 13, 1991, Ser. No. 807,445
Int. Cl.[5] F22B *37/52*
U.S. Cl. 122—392 **19 Claims**
MICROFICHE APPENDIX INCLUDED
(233 Microfiche, 3 Pages)



1. A process for controlling the sootblowing of a coal fired boiler-steam turbine electrical generator system having sootblowers at various locations in the combustion gas side to periodically remove soot from heat transfer surfaces, said process comprising the steps of:

(a) obtaining current system operating data from strategically located sensors;

(b) analyzing the data to provide a current status condition of the system;

(c) calculating the effect of implementing various sootblowers; and

(d) determining if implementing any of the sootblowers will have a beneficial effect on the system.

5,181,483

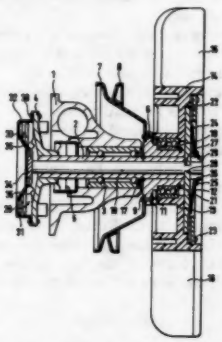
AUTOMATICALLY COUPLING FAN FOR AUTOMATIVE COOLING SYSTEMS

Anton Ryba, Bozen, Fed. Rep. of Germany, assignor to Harald Mair-Egg, St. Leonhard, Italy

Filed Mar. 6, 1991, Ser. No. 665,091
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1990, 4011946; Nov. 8, 1990, 4035510
Int. Cl.[5] F01P *7/02*
U.S. Cl. 123—41.12 **8 Claims**

1. Automatically coupling fan for a cooling system of an automobile comprising a thermostat mounted on a water pump shaft, said thermostat comprising a gas-tight container with a fixed wall and a flexible wall, containing a liquid filler having a vapor pressure which, within a predetermined temperature

range, couples the fan to a drive shaft of the automobile by means of a friction clutch, wherein said thermostat comprises a metal bellows which rotates with the water pump shaft, said bellows having dimensions such that a ring of the liquid filler generated during rotation of the thermostat by centrifugal forces exerted on the liquid thermostat filler remains substantially outside the effective cross-section (a_w) of the bellows,



wherein the fan is coupled in a predetermined temperature range substantially exclusively according to the vapor pressure of the liquid filler arising in the thermostat, wherein a part of the friction clutch connected to the fan comprises two circular friction surfaces positioned at a distance from each other, between which a clutch part connected to the rod projects, said clutch part being subjected to contact pressure on both of its surface when the fan is coupled.

5,181,484

CAM TIMING CONTROL DEVICE FOR AUTOMOTIVE ENGINE

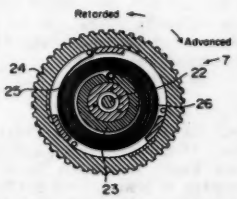
Toshiya Kan, and Katsuhiko Sakamoto, both of Higashihiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 6, 1992, Ser. No. 846,709

Claims priority, application Japan, Mar. 26, 1991, 3-61467

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.17 **9 Claims**



1. In a valve timing correcting device of a type wherein an electromagnetic force is used to change a cam timing, a cam timing control device for use in association with an automotive engine which comprises control means operable, in the event that a resistance to the change of the cam timing is high, to prolong the length of time during which an electric power is continuously supplied to the electromagnetic coil.

5,181,485

VALVE DRIVING MECHANISM FOR DOUBLE OVERHEAD CAMSHAFT ENGINE

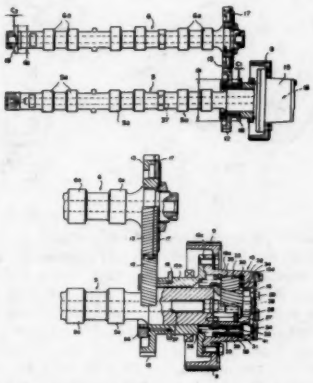
Ichiro Hirose; Tomohisa Handa; Noriyuki Iwata, and Masahiro Choshi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 27, 1991, Ser. No. 675,612

Claims priority, application Japan, Mar. 29, 1990, 2-81548; May 24, 1990, 2-54787[U]

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.17 **11 Claims**



1. A valve drive mechanism for an internal combustion engine, comprising:

an intake overhead camshaft having one cam for driving each intake valve of the internal combustion engine;

an exhaust overhead camshaft, in juxtaposition with said intake overhead camshaft, having one cam for driving each exhaust valve of the internal combustion engine, said exhaust overhead camshaft being operationally coupled to said intake overhead camshaft;

camshaft drive means for transmitting engine output from a crankshaft of the internal combustion engine to one of said intake and exhaust overhead camshafts;

gear means for connecting rotation of said one of said intake and exhaust overhead camshafts to another of said intake and exhaust overhead camshafts, said gear means comprising helical gears in mesh with each other; and

variable valve timing means for varying a valve timing at which one of said intake and exhaust valves is driven relative to a valve timing at which the other of said intake and exhaust valves is driven;

said variable valve timing means having slidable means, mounted on said one of said intake and exhaust overhead camshafts for axial displacement, for operationally coupling said one of said intake and exhaust overhead camshafts to said camshaft drive means so as to cause a relative rotational displacement therebetween when said slidable means causes axial displacement with respect to said one of said intake and exhaust overhead camshafts,

said slidable means comprising cylindrical piston means with internal and external helical coupling means for coupling with said one of said intake and exhaust overhead camshafts and said camshaft drive means, respectively,

said internal and external helical coupling means, respectively, comprising helical splines cut in opposite directions,

said camshaft drive means including internal helical splines cut in a direction opposite to helical threads of one of said helical gears mounted on said one of said intake and exhaust overhead camshafts.

5,181,486

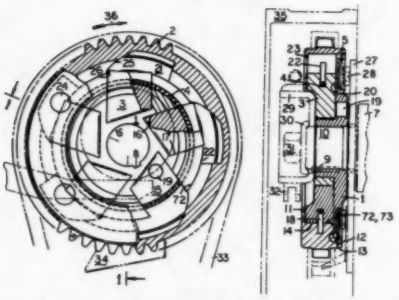
TIMING-RANGE GEAR

John S. Gyurovits, 2256 Brookside Dr., Martinsville, N.J. 08836-9659

Continuation-in-part of Ser. No. 721,400, Jun. 26, 1991. This application Sep. 16, 1992, Ser. No. 945,370

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.17 **14 Claims**



1. A centrifugal force governed valve timing device used as a compact integral part of an internal combustion engine for adjusting at least one of an advancing and a retarding of a relative angular position of a driven camshaft with respect to an angular position of a driving crankshaft, the camshaft having a central longitudinal axis, said device includes a camshaft drive means comprising:

an inner-hub member having an axial bore for removably interfacing the camshaft, a first circular cavity coaxial to said bore extending inward from a first planar mating surface for receiving existing engine components, a circular load-bearing periphery, a flange extending outward form said circular load-bearing periphery and having a second planar mating surface, and a first radial cavity means extending from said first planar mating surface to said second planar mating surface and extending radially inward from said circular load-bearing periphery for receiving and cooperatively interacting with a slidable flyweight means;

an outer-hub member, in a phased relation to a crankshaft, having a circular central cavity with a journaling surface ending at a flat-bottom thereof for slidably receiving and rotatably interacitng with said inner-hub member through said first and second planar surfaces and said circular load-bearing periphery thereof, and having a second radial cavity means extending radially outward from the journaling surface;

said slidable flyweight means includes at least one member, each said member including a phasing portion, said phasing portion including a rounded corner, said rounded corner engaging a corresponding phasing surface of the second radial cavity means of said outer-hub member, wherein a sliding action of the slidable flyweight means is translated into angular displacement between said inner-hub and outer-hub members;

and a spring means disposed to interact with said slidable flyweight means.

5,181,487

SPLIT OIL PAN CONSTRUCTION

Timothy E. Rodabaugh, 9515 Culberson, Dallas, Tex. 75227

Filed Feb. 27, 1992, Ser. No. 842,270

Int. Cl.[5] F16N *31/00*

U.S. Cl. 123—195 C **3 Claims**

1. A split oil pan construction arranged for securement to an internal combustion engine, wherein the oil pan comprises,

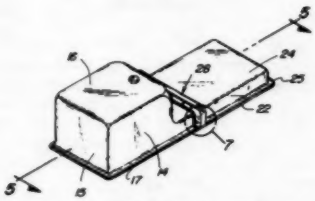
a rear pan member selectively securable to a forward pan member, the rear pan member including a rear pan right side wall spaced from a rear pan left side wall, and a rear pan rear side wall, and

a floor extending from the rear pan rear side wall coextensively along the rear pan right side wall and the rear pan left side wall, with the rear pan right side wall, rear pan left side wall, and the rear pan floor terminating in a rear pan securement flange integral with, coextensive to, and orthogonally oriented relative to a forward distal end of the rear pan floor, rear pan left side wall, and the rear pan right side wall, and

a U-shaped mounting flange integrally formed to each upper distal end of the rear pan right side wall, rear pan left side wall, and rear pan rear side wall, and

the forward pan member including a forward pan right side wall spaced from a forward pan left side wall, and a forward pan forward wall, and a forward pan floor extending from the forward pan forward wall coextensively along the forward pan right side wall and the forward pan left side wall, and

a forward pan mounting flange coplanar with the rear pan mounting flange, with the forward pan mounting flange of a generally U-shaped configuration formed to each upper distal end of the forward pan right side wall, forward pan left side wall, and forward pan forward wall, and



a forward pan securement flange integrally and orthogonally mounted in a coextensive relationship relative to the forward pan right side wall, forward pan left side wall, and forward pan floor, and

the forward pan securement flange is arranged for contiguous and coextensive abutment with the rear pan securement flange, and

the rear pan securement flange includes a plurality of rear pan securement flange apertures, and the forward pan securement flange includes a plurality of forward pan securement flange apertures, with each rear pan securement flange aperture coaxially aligned with a forward pan securement flange aperture, and

a fastener pan, the fastener pan including a fastener pan trough arranged to receive the rear pan securement flange and the forward pan securement flange therewithin, the fastener pan including a trough rear wall spaced from and parallel to a trough forward wall, and a trough floor extending coextensively along the trough rear wall and the trough forward wall, and a sealer member arranged for reception within the trough, with the sealer member receiving the rear pan securement flange and the forward pan securement flange therewithin.

5,181,488

TWO DIFFERENT FUEL FEEDER

Yoshihiro Sakurai, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 5, 1990, Ser. No. 593,780

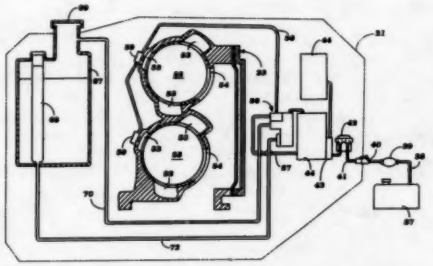
Claims priority, application Japan, Oct. 5, 1989, 1-258912

Int. Cl.[5] F02M *1/16*

U.S. Cl. 123—179.11 **3 Claims**

1. The enrichment system for an internal combustion engine comprising: means for supplying primed enrichment fuel to said engine, means for supplying flowing enrichment fuel to said engine, means for simultaneously actuating both of said means for supplying, said means for supplying a primed enrich-

ment fuel is an enrichment primer pump which further comprises: a housing defining a pump chamber, a first check valve having an inlet forming said inlet of said enrichment primer pump, and an outlet in fluid communication with said pump chamber, a second check valve having an inlet in fluid communication with said pump chamber and an outlet forming said outlet of said enrichment primer pump; a spring within said

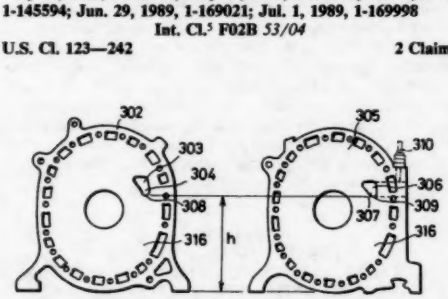


pump chamber in urging contact between said housing and said diaphragm; a plunger extending through an aperture in said housing in touching contact with said diaphragm and opposing said urging engagement of said spring with said diaphragm; and, leverage means in contact with said plunger for urging said plunger in said diaphragm against said spring for actuating said enrichment primer pump.

5,181,489
ROTARY ENGINE

Yoshihiro Bando, Tokushima, Japan, assignor to Bando Kiko Co., Ltd., Tokushima, Japan

Division of Ser. No. 448,100, Dec. 13, 1989, Pat. No. 5,121,721. This application Dec. 30, 1991, Ser. No. 814,615
Claims priority, application Japan, Dec. 24, 1988, 63-327261; May 24, 1989, 1-132150; May 25, 1989, 1-136959; Jun. 7, 1989, 1-145594; Jun. 29, 1989, 1-169021; Jul. 1, 1989, 1-169998
Int. Cl.[5] F02B *53/04*
U.S. Cl. 123—242 **2 Claims**

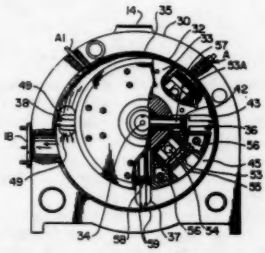


1. A rotary engine comprising:
a rotor having two side faces;
a first side housing facing one of said two side faces of said rotor so as to define a first space between said one side face of the rotor and said first side housing, and having a first intake port formed therein with a predetermined opening area; and
a second side housing facing the other of said two side faces of said rotor so as to define a second space between said other side face of the rotor and said second side housing, and having a second intake port formed therein, the second intake port having an opening area different from the opening area of the first intake port;
a starting end for the opening of said first intake port with respect to a rotating direction of said rotor being positioned equivalent to that of a starting end for the opening of said second intake port so as to balance gas pressures in the first space and the second space with each other.

5,181,490
ROTARY ENGINE

Ivan Ruzic, 5130 Portage Rd., Apt. 216, Niagara Falls, Ontario, Canada L2E 6Z4

Continuation-in-part of Ser. No. 438,725, Nov. 17, 1989, abandoned. This application May 14, 1991, Ser. No. 699,665
Int. Cl.[5] F02B *53/00*
U.S. Cl. 123—243 **17 Claims**



1. A rotary internal combustion engine comprising:
a housing defining a substantially circular rotor chamber therein, said chamber having a circumferential wall;
drive shaft means extending into said chamber;
a circular rotor in said chamber mounted on said drive shaft means to rotate therewith and having a diameter less than the diameter of said chamber, said rotor and drive shaft means being offset from the center axis of said chamber;
inlet means for introducing air and fuel into said chamber, said inlet means extending through said housing and opening into said chamber;
outlet means for exhaust gases extending through said housing and in fluid communication with said chamber;
at least two pairs of vanes slidingly mounted in said rotor, one vane of each pair being located diametrically opposite to the other vane of the pair;
means for fixedly connecting the vanes of each pair together so that a predetermined total distance between outer ends of said vanes of each pair remains constant and the same for each pair of vanes, said predetermined distance being substantially equal to the distance from a specific point on said circumferential wall of the chamber which is closest to the circumferential periphery of the rotor and a second point on the wall of said chamber diametrically opposite said specific point;
two separate rings having radial bores being slidably mounted on said drive shaft means;
said connecting means comprising two rods extending between the vanes of each pair and being slidable in radial bores in said drive shaft means and said rings, said rings permitting thermal expansion and contraction of said vanes;
wherein a portion of each of two circumferential wall sections is slightly removed from an initial, internal wall section that is cylindrical, to permit full rotation of said rotor and vanes in said chamber.

5,181,491

INTAKE SYSTEM IN MULTI-CYLINDER TYPE INTERNAL COMBUSTION ENGINE

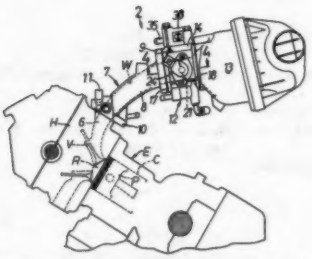
Masahiro Izumi; Toshiharu Aoshima; Yutaka Ide; Ritsuko Terawaki, and Hideaki Hosoya, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1992, Ser. No. 842,703

Claims priority, application Japan, Mar. 1, 1991, 3-036100

Int. Cl.[5] F02D *9/00*; F02B *75/18*

U.S. Cl. 123—336 **12 Claims**



1. An intake system in a multi-cylinder type internal combustion engine, comprising a plurality of intake passages independently leading to cylinders in an engine body and commonly connected to an air cleaner, throttle valves independently disposed in the intake passages, and fuel injection valves independently disposed in the intake passages at positions downstream of the throttle valves in an intake direction in correspondence to the cylinders, wherein

each of said intake passages comprises an intake manifold connected to the engine body and a throttle body having opposite ends directly connected to the intake manifold and the air cleaner, respectively, said throttle body including a plurality of funnel-shaped portions provided therein and spread toward an upstream side to define upstream ends of the intake passages, and

each of said throttle valves is disposed in the throttle body, so that an upstream end of the throttle valve, in the intake direction, is located at least on the corresponding funnel-shaped portion when said throttle valve is fully opened, said throttle body having ports which are opened into the intake passages between a coupled surface of the throttle body to the intake manifold and the throttle valves, respectively, and which communicate with one another.

5,181,492

SHAFT-ROTATED THROTTLE DISK

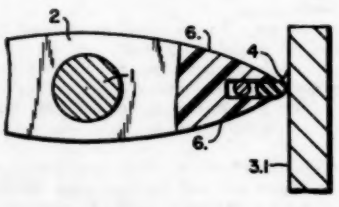
Andreas Sausner, Frankfurt am Main, and Karl H. Spies, Birkenau, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Oct. 23, 1991, Ser. No. 781,783

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1990, 4100378

Int. Cl.[5] F02D *9/08*

U.S. Cl. 123—337 **7 Claims**



1. In a shaft-rotated throttle disk for use in the intake pipe of an internal combustion engine, whereby the shaft is solid and the disk includes a body of material surrounding the shaft, the lateral face sides of the body of material surrounding the shaft forming first sealing surfaces that extend in a direction transverse to the shaft; the improvement comprising resilient lips of elastomeric material arranged on the outside of the body of material and secured to its circumference and extending on both sides thereof as far as the shaft, said resilient lips forming second sealing surfaces which can be fully engaged with the intake pipe of the engine by rotating the shaft.

5,181,493

OPERATION CONTROL DEVICE FOR IN-CYLINDER INJECTION ENGINE

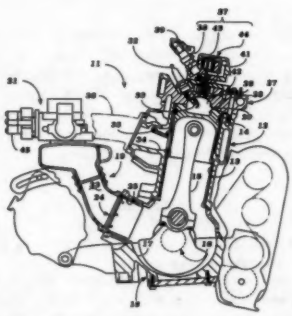
Yu Motoyama, and Ryusuke Katoh, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed May 24, 1991, Ser. No. 705,293

Claims priority, application Japan, May 25, 1990, 2-136644

Int. Cl.[5] F02B *7/00*

U.S. Cl. 123—431 **39 Claims**



1. A fuel injection system for an internal combustion engine having a combustion chamber, an induction system for introducing a charge into said combustion chamber, throttle valve means for controlling the flow through said induction system, a main fuel injector for injecting fuel directly into said combustion chamber, an auxiliary fuel injector for injecting fuel into said induction system, means for sensing an abnormal condition of said main fuel injector, and means for operating said auxiliary fuel injector to supply a different amount of fuel to said engine in the event an abnormal condition of said main fuel injector is sensed.

5,181,494

HYDRAULICALLY-ACTUATED ELECTRONICALLY-CONTROLLED UNIT INJECTOR HAVING STROKE-CONTROLLED PISTON AND METHODS OF OPERATION

Thomas G. Ausman, Peoria; Douglas E. Longman, Naperville, and Alan R. Stockner, Metamora, all of Ill., assignors to Caterpillar, Inc., Peoria, Ill.

Filed Oct. 11, 1991, Ser. No. 776,502

Int. Cl.[5] F02M *47/00*

U.S. Cl. 123—446 **23 Claims**

1. A method of operating a hydraulically-actuated electronically-controlled unit injector adapted for starting an engine comprising the steps of:

applying an electrical fuel delivery command signal of a selected first pulsewidth to an electrically-actuated valve of the unit injector to open the valve during the first pulsewidth;

supplying pressurized actuating fluid to the unit injector in response to the valve being opened during the first pulsewidth;

hydraulically displacing a piston of the unit injector over a first displacement to effect a first fuel injection quantity in response to the pressurized actuating fluid being supplied to the unit injector during the first pulsewidth;

discontinuing the electrical fuel delivery command signal of the selected first pulsewidth to close the valve and end the first fuel injection quantity;

applying another electrical fuel delivery command signal of a selected second pulsewidth to the electrically-actuated valve of the unit injector after the engine is started to open the valve during the second pulsewidth, said second pulsewidth being less than the first pulsewidth;

supplying pressurized actuating fluid to the unit injector in response to the valve being opened during the second pulsewidth;

hydraulically displacing the piston of the unit injector over a second displacement to effect a second fuel injection quantity in response to the pressurized actuating fluid being supplied to the unit injector during the second pulsewidth; and

discontinuing the electrical fuel delivery command signal of the selected second pulsewidth to close the valve and and the second fuel injection quantity.

2. The method of claim 1 wherein the second displacement of the piston is less than the first displacement, said second fuel injection quantity being less than the first fuel injection quantity.

5,181,495

INTERNAL COMBUSTION POWERED DEVICE FOR SETTING FASTENING ELEMENTS

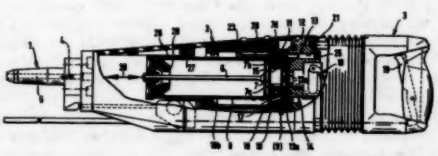
Hans Gschwend, Mauren, Switzerland, and Johann Buechel, Sevelen, Austria, assignors to Hilti Aktiengesellschaft, Furstentum, Liechtenstein

Filed Oct. 1, 1991, Ser. No. 769,296

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1990, 4032202

Int. Cl.[5] B25C *1/08*

U.S. Cl. 123—46 SC **9 Claims**



1. Portable, internal combustion powered work device, such as a setting device for driving fastening elements into a receiving material, comprising an axially extending combustion chamber (**9**) for receiving and igniting therein an air-fuel mixture, an axially extending piston (**7**, **7*a***) guided in the axial direction thereof in an axially extending guide cylinder (**8**) located within and axially displaceable relative to said combustion chamber, wherein the improvement comprises means (**11,12,13,20**) in said combustion chamber (**9**) for reducing the volume thereof to approximately zero after the air-fuel mixture introduced into the combustion chamber is ignited and drives said piston, said means comprising movable combustion chamber wall parts (**11**, **12**, **13**) extending transversely of the axis of said combustion chamber (**9**) and displaceable toward a rear wall (**14**) of said combustion chamber for reducing the volume thereof.

5,181,496

AIR/FUEL RATIO CONTROL APPARATUS IN AN INTERNAL COMBUSTION ENGINE

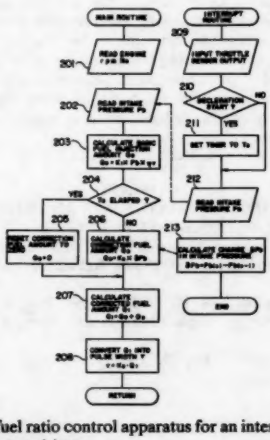
Shinji Kojima, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1991, Ser. No. 783,872

Claims priority, application Japan, Oct. 30, 1990, 2-290726

Int. Cl.[5] F02D *41/12*

U.S. Cl. 123—493 **6 Claims**



1. An air/fuel ratio control apparatus for an internal combustion engine comprising:

a fuel injector for supplying fuel to an engine;

engine operating parameter sensing means for periodically sensing an engine operating parameter and generating a corresponding output signal;

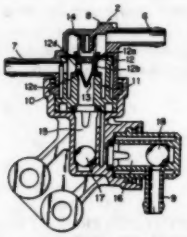
a deceleration sensor for sensing the beginning of engine deceleration; and

control means for calculating, from the output signal of said engine operating parameter sensing means, a change in the engine operating parameter between two consecutive points in time, said control means being operable to further calculate a corrected amount of injection fuel supplied to the engine on the basis of the change in the engine operating parameter thus obtained, said control means controlling said fuel injector such that said fuel injector can supply the corrected amount of fuel to the engine during a predetermined length of time from the moment at which said deceleration sensor has sensed the beginning of engine deceleration.

5,181,497
EVAPO-CONTROL VALVE

Yoshiharu Matsushita, and Kazumasa Komura, both of Ibaraki, Japan, assignors to Kyosan Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1992, Ser. No. 838,350
Int. Cl.[5] F02M *33/02*; F16K *24/00*
U.S. Cl. 123—520 **17 Claims**

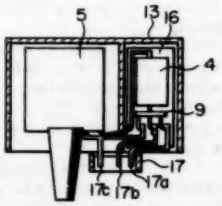


1. An evapo-control valve, which is disposed in a pipe for connecting a fuel tank and a canister, comprising:
- a fuel tank side connecting port which communicates with the fuel tank;
- a canister side connecting port which communicates with the canister;
- an intake manifold side connecting port which communicates with an intake manifold;
- a closing valve for permitting the canister side connecting port to communicate with the fuel tank side connecting port by a negative pressure in the intake manifold side connecting port during the operation of an engine; and
- a check valve for permitting the atmosphere in the canister to communicate with the fuel tank when the fuel tank is negatively pressurized due to cold weather during the stop of the engine.

5,181,498
IGNITION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Mitsuru Koiwa, and Shingo Morita, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1991, Ser. No. 794,231
Claims priority, application Japan, Nov. 21, 1990, 2-121183[U]
Int. Cl.[5] F02P *11/00*
U.S. Cl. 123—633 **1 Claim**

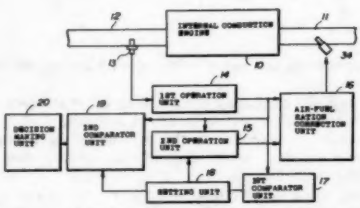


1. A capacitor discharge ignition apparatus for an internal combustion engine, comprising:
- a) a DC power supply (**1, 2, 3**) for outputting a relatively low voltage charging current;
- b) signal generating means (**7**) for generating a relatively low voltage trigger signal output in synchronism with the rotation of the engine;
- c) an ignition coil (**5**) having a primary winding and a secondary winding which is connected to a spark plug;
- d) a capacitor (**4**) having one end thereof connected to one end of the primary winding of said ignition coil;
- e) a switching element (**9**) connected in series between another, opposite end of said capacitor and another, opposite end of the primary winding of said ignition coil to form a high voltage discharge path for said capacitor;
- f) wiring harness means (**15**) connecting an output of said DC power supply to said another end of said capacitor to charge the capacitor, and connecting the trigger signal output of the signal generating means to a control terminal of the switching element; and
- g) a single, unitary casing (**13**) surrounding, housing and mounting, exclusively, the ignition coil, the capacitor, the switching element and all wiring connections therebetween to minimize the length of said wiring connections and to attendantly reduce noise signals generated by the high voltage discharge of said capacitor and minimize energy loss in said wiring connections.

5,181,499
APPARATUS FOR DIAGNOSING ABNORMALITY IN FUEL INJECTION SYSTEM AND FUEL INJECTION CONTROL SYSTEM HAVING THE APPARATUS

Nobuaki Kayanuma, Gotenba, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Feb. 27, 1992, Ser. No. 842,425
Claims priority, application Japan, Mar. 8, 1991, 3-43827
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—690 **15 Claims**



1. An apparatus for diagnosing an abnormality in a fuel injection system in which an injection quantity is feedback-controlled by adjusting a first air-fuel ratio correction value so that an air-fuel ratio is equal to a target air-fuel ratio, said apparatus comprising:

operation means for generating a second air-fuel correction value used for adjusting the injection quantity so that said first air-fuel ratio correction value is within a first predetermined range;

first comparator means for comparing said first air-fuel ratio correction value with a first upper limit value and a first lower limit value;

setting means, coupled to said first comparator means, for forcibly setting the second air-fuel ratio correction value to a second upper limit value when it is determined by said first comparator means that said first air-fuel correction value has reached said first upper limit value and for forcibly setting the second air-fuel ratio correction value to a second lower limit value when it is determined by said first comparator means that said first air-fuel ratio correction value has reached said first lower limit value;

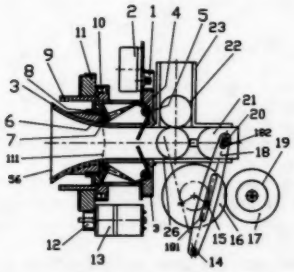
second comparator means, coupled to said setting means, for determining whether or not said first air-fuel ratio correction value obtained after said second air-fuel ratio correction value is set by said setting means is within a second predetermined range; and

decision making means, coupled to said second comparator means, for making a decision that a fault has occurred in the fuel injection system when said second comparator means determines that said first air-fuel ratio correction value is outside of said second predetermined range.

5,181,500
PINCERS FOR THROWING AND CATCHING A FLYING DISC
Marc Chamberland, R.R. #6, Box 17, Cobourg, Ontario, Canada K9A 4J9
Filed May 6, 1991, Ser. No. 695,906
Int. Cl.[5] A63B *65/00*
U.S. Cl. 124—5 **5 Claims**

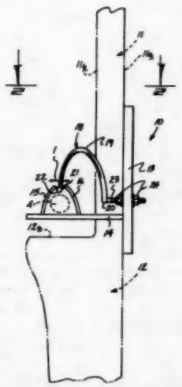
1. Pincers for throwing and catching a flying disc comprising: first and second jaws, each jaw having first ends pivotally interconnected, a second end of each said first and second jaws having a pad connected thereto, each said pad facing the pad connected to the other of said jaws, said pads having portions configured to selectively engage and disengage said disc, a pair of handles, each handle having one end connected to one of said jaws at a point intermediate the ends of said jaws whereby opening and closing of said handles provide for a corresponding opening and closing of said jaws with resulting disengagement and engagement of said disc by said pads and wherein the other ends of said handles are connected together.

5,181,501
PING-PONG BALL SHOOTER
Wei M. Lien, No. 16, Lane 402, Anping Rd., Sec. 2, Hsin-Chu City, Taiwan
Filed Feb. 27, 1991, Ser. No. 661,123
Int. Cl.[5] A63B *69/40*
U.S. Cl. 124—10 **10 Claims**



1. A ping-pong ball shooter comprising:
a) a ball shooting means including an abruptly returning mechanism for pushing a ping-pong ball;
b) a rotating mechanism operatively associated with the ball shooting means, the rotating mechanism comprising:
i) a first motor rotating a first gear;
ii) a second, larger gear engaged with the first gear to be driven thereby;
iii) a ball pipe attached to the second gear so as to accommodate a ping-pong ball therein; and
iv) at least one torque spring attached to the second gear so as to rotate therewith and having a first end extending into the ball pipe and a second end, said first end adapted to engage a ping-pong ball and supply a shooting force thereto;
c) speed changing means operatively associated with the ball shooting means to control the speed of the shot ping-pong ball;
d) ball direction means including an eye ball reciprocating mechanism operatively associated with the ball shooting means to control the direction of the shot ping-pong ball; and,
e) ball feeding means operatively associated with the ball shooting means.

5,181,502
ARROW GUIDE APPARATUS
Paul E. Ray, 5111 Wildwood Road, Pascagoula, Miss. 39581
Filed Aug. 6, 1991, Ser. No. 740,718
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—44.5 **5 Claims**



1. An arrow guide apparatus in combination with an archery bow, wherein the archery bow includes a handle riser section, the handle riser section including an exterior side wall spaced from and parallel an interior side wall, and
an arrow rest ledge defined by the handle riser section orthogonally oriented relative to the handle riser section at a lower terminal end thereof,
and
a mounting plate fixedly mounted to the exterior side wall, the mounting plate including a support leg integrally mounted to the mounting plate extending orthogonally relative to the mounting plate in a spaced relationship above the arrow rest ledge, the support leg including a first arcuate guide leg and a second arcuate guide leg fixedly mounted to the support leg extending above the support leg and the arrow rest ledge adjacent the interior side wall, wherein the first and second arcuate guide legs each define a concave interior surface in confrontation relative to one another, and the first and second arcuate guide legs are coextensive relative to one another,
and
the first and second arcuate guide legs define a guide leg gap therebetween, wherein the guide leg gap is defined between a respective first and second free terminal end of the respective first and second arcuate guide legs spaced from the support leg,
and
an alignment leg fixedly mounted to the mounting plate, wherein the alignment leg extends above the gap medially thereof, and
the alignment leg includes a central "U" shaped body projecting above the support leg, the "U" shaped body including a body first end and a body second end, the body first end oriented below the second end, and the first end including a threaded rod fixedly mounted thereto, the

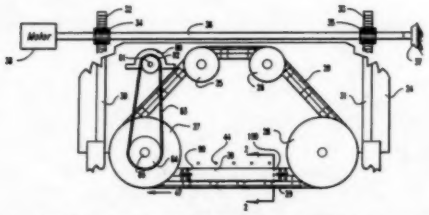
threaded rod orthogonally projecting into the mounting plate, and the threaded rod reciprocatably mounted within the mounting plate in an adjustable relationship, and including a plurality of fastener members securable to the threaded rod to selectively secure the threaded rod relative to the mounting plate.

5,181,503

STONE SLAB SAW

Donald D. Fish, and James K. Standish, both of Bedford, Ind., assignors to W. F. Meyers Company, Inc., Bedford, Ind.

Filed Jun. 26, 1991, Ser. No. 721,161
Int. Cl.[5] B24B *21/00*; B28D *1/08, 1/12*
U.S. Cl. 125—21 **6 Claims**



1. A device for cutting a block of stone into slabs comprising:

a main frame;

a continuous flexible belt including a continuous flexible metal cable with said belt movably mounted to said main frame and including an inwardly facing surface extending around said main frame, said belt further including an outwardly facing abrasive surface extending in a plane laterally across said belt for engaging and cutting a block of stone;

first drive means mounted to said main frame and engaged with said belt for continuously moving said belt across said block of stone in a single direction;

guide means on said main frame including opposite end portions with a downwardly opening recess extending therebetween complementarily receiving said inwardly facing surface guiding said belt as said belt is moved by said first drive means in said single direction, said guide means is in a state of tension providing a straight and rigid backing for said belt;

second drive means connected to said main frame operable to force said main frame with said guide means downwardly backing said belt so said abrasive surface cuts a slot into said block of stone forming a slab;

lubrication means connected to said guide means and operable to force a lubricant between said recess and said inwardly facing surface; and,

a plurality of mounting blocks mounted to said cable and having said abrasive surface mounted thereon, said blocks each including a metal main body with an inwardly projecting portion and an opposite distal end, said blocks each further including an abrasive strip affixed to said distal end with said blocks including passages through which said cable extend, said mounting blocks with abrasive strips each forming a geometric cross section; and wherein:

said guide means includes a bar mounted to said frame with said downwardly opening recess thereon to complementarily and slidably receive said inwardly facing surface of said belt and said inwardly projecting portion of said mounting blocks, said guide means further includes a plurality of passageways opening into said recess with said passageways in communication with said lubrication means to space said belt with said blocks apart from said bar;

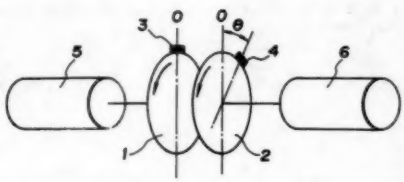
said belt is of molded plastic construction with said molded plastic construction having a cross section the same as said geometric cross section and extending between said plurality of mounting blocks and around said cable to a position adjacent to said abrasive surface holding said blocks in place on said cable, said inwardly facing surface is formed by said plastic construction and by said blocks and has an inverted shape projecting into said downwardly facing recess of said guide means.

5,181,504

VIBRATION GENERATOR USING ROTARY BODIES HAVING UNBALANCED WEIGHTS, AND VIBRATORY STIMULATING APPARATUS USING SAME VIBRATION GENERATOR

Takahiko Ono, and Youichi Endo, both of Tokyo, Japan, assignors to Ono Sokki Co., Ltd., Tokyo and Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, both of, Japan

Filed Mar. 16, 1990, Ser. No. 494,426
Claims priority, application Japan, Mar. 20, 1989, 1-30878[U]
Int. Cl.[5] A61H *1/00*
U.S. Cl. 128—36 **20 Claims**



1. A vibration generator using rotary bodies having unbalanced weights, comprising:

two spaced non-contacting rotary bodies having unbalanced weights disposed in out of phase relation with respect to each other;

driving means for rotating said rotary bodies;

single-element detectable members on said rotary bodies in predetermined positional relation with respect to said rotary weights;

rotation detectors mounted in fixed positions proximate the loci of rotational movements of said detectable members and adapted to output pulse signals when detectable members pass a respective relative rotation detector, so that a pulse signal is outputted for each revolution of a rotary body;

phase difference computing means connected to said rotation detectors for computing a phase difference between said unbalanced weights on said two rotary bodies in response to said signals from said rotation detectors and outputting a phase difference signal; and

rotation controlling means connected to said phase difference computing means and said rotary body driving means and adapted to control said rotary body driving means in response to said phase difference signal from said phase difference computing means so that said phase difference signal reaches a predetermined level.

5,181,505

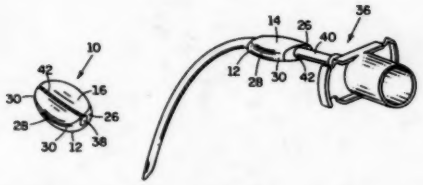
METHOD AND APPARATUS FOR DELIVERY OF A MEDICAMENT IN THE ORAL CAVITY

Chel W. Lew, 9218 Old Homestead, San Antonio, Tex. 78230; Thomas B. Aufdemorte, 1638 Vista del Monte, San Antonio, Tex. 78216; Howard S. McGuff, 3226 Falcon Grove, San Antonio, Tex. 78247, and Gerald L. Alderson, 114 Cherokee La., San Antonio, Tex. 78232

Continuation of Ser. No. 320,500, Mar. 8, 1989, abandoned. This application Jun. 28, 1991, Ser. No. 726,628

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—200.26 **22 Claims**



1. An apparatus for delivery of a medicament in the upper aerodigestive tract of a patient comprising:

an endotracheal tube;

a generally ovoid body comprised of a substrate impregnated with a medicament to be delivered in the upper aerodigestive tract of a patient;

said body having front, side, top and bottom surfaces, the front and side surfaces having a curved and tapered shape for engaging the mucosa of the aveolar ridge and the top surface being shaped for engaging the mucosa of the palate when the bottom surface rests of the tongue of the patient, thereby stabilizing said body in the oral cavity of the patient while allowing sufficient clearance between the mucosa and said body to allow circulation of the saliva around said body to facilitate release of the medicament therefrom; and

a channel through said body comprising a slit for passage of said endotracheal tube through said body, the endotracheal tube and said channel cooperating with the engagement of the mucosa by said body to stabilize said body and the endotracheal tube in the oral cavity.

5,181,506

MULTILAYER PROTECTIVE GAS MASK

Albert N. Tardiff, Jr., Bel Air, Md., and Corey M. Grove, Red Lion, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 2, 1991, Ser. No. 695,142

Int. Cl.[5] A62B *17/04*

U.S. Cl. 128—201.22 **22 Claims**

1. A gas mask comprising:

a face piece having a plurality of layers, the outer layer being removably attached to an adjacent layer;

a nose cone formed in said face piece for providing an enclosed space about the nose and mouth of wearer;

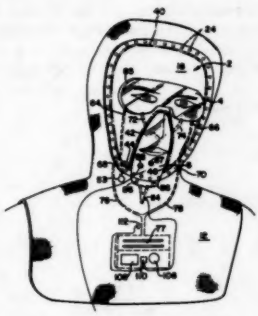
an eye outsert formed from one of said layers;

means forming inhaled air passageways between adjacent layers from the periphery of said face piece to said eye outsert and from said eye outsert to said nose cone:

means defining an exhaled air passageway for conducting air from said nose cone to a point outside of said mask;

means around the periphery of said face piece for forming a seal with the head of a user when pressed thereagainst;

means for forming a seal between the periphery of said nose cone and the skin of a user when pressed thereagainst; and



means adapted to pull the face piece toward the head of a wearer so as to press said seals against the head of a wearer.

5,181,507

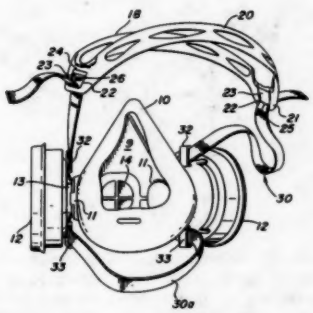
AIR PURIFYING RESPIRATOR SUSPENSION

M. John Michel, Coatesville; Frederick D. Snyder, Breinigsville, and Venkateswara R. Emany, Sinking Spring, all of Pa., assignors to WGM Safety Corp., Reading, Pa.

Filed Oct. 25, 1991, Ser. No. 782,394

Int. Cl.[5] A62B *7/00*

U.S. Cl. 128—201.25 **24 Claims**



12. In combination with a respirator face mask for covering the mouth and nasal passages of the user and having a peripheral sealing portion of yieldable material for establishing a seal with the user's face, said mask having a centrally located air outlet passage, air inlet passage s disposed on either side of said centrally located air outlet passage and filter cartridges disposed in said air inlet passages, each cartridge extending from the sides of said face mask and containing a filter media for purification of air inhaled through the air inlet passages, a suspension system comprising:

a crown support adapted for support on the head of the user and having first and second parts extended respectively over the top and the back of the head of the user, said first and second parts converging in junction portions at each side of the usre's head;

an elastic strap extending from one of said junction portions to the other; and

adjustable latch means for varying the length of said elastic strap between the junction portions and strap guide means fixedly secured relative to said face mask on opposite sides thereof, the strap being extended from the junction por-

tion on one side of the user's head first through the strap guide means on one side of the face mask, then around the use's neck, next through the guide means on the other side of the face mask and then to the junction portion on the said other side of the user's head, the strap guide means and the juncture portions being relatively positioned for the application by said elastic strap means of a constant upwardly and rearwardly acting mask sealing pressure on the face of the user.

5,181,508

MOLDED CONNECTOR

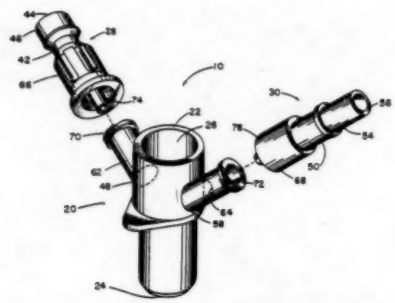
Samuel E. Poole, Jr., 6354 Saint Andrews Cir., Fort Myers, Fla. 33919

Continuation-in-part of Ser. No. 301,723, Jan. 26, 1989, Pat. No. 4,953,547. This application Aug. 6, 1990, Ser. No. 562,754

The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.

Int. Cl.[5] A61M *16/10*

U.S. Cl. 128—203.12 **10 Claims**



1. A drug administering endotracheal respiration system for administering vital life-saving drugs into the lungs of a victim while maintaining the flow of life-supporting gas thereto via ventilation apparatus comprising in combination:

a gas supply;

a tube for establishing gas flow exchange between the lungs of the victim and the gas supply, the tube having a proximal end and a distal end for insertion into the trachea of the victim; and

a connector for coupling the proximal end of the tube to the gas supply, the connector being formed as a cylinder with a gas input end and a gas discharge end and a linear main axial passageway therebetween, the connector having a first port adapted for injecting vital life-saving drugs in liquid form into the passageway and then into the distal end of the tube intermixed with the gas, the first port having a portion integrally formed with the connector and a portion separable therefrom, the connector further having a second port adapted for injecting vital life-saving drugs in liquid form into the passageway and then into the distal end of the tube intermixed with the gas, the second port having a portion integrally formed with the connector and a portion separable therefrom, the main axial passageway adapted for atomizing and intermixing of the flow of life-saving drugs with the life-supporting gas.

5,181,509

TRANSTRACHEAL CATHETER SYSTEM

Bryan T. Spofford, 1470 S. Quebec Way, #227, and Kent L. Christopher, 9086 E. Colorado Cir., both of Denver, Colo. 80231

Continuation of Ser. No. 883,409, Jun. 13, 1986, abandoned. This application Oct. 29, 1991, Ser. No. 784,123

The portion of the term of this patent subsequent to Feb. 25, 2009, has been disclaimed.

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—207.140 **21 Claims**

1. An apparatus for supplying oxygen to supplement the ventilation of a patient without interfering with the normal breathing of said patient, said apparatus comprising:

a transtracheal catheter for insertion into the trachea of the patient, said transtracheal catheter including:

an elongated flexible tube formed of a biocompatible material having a proximate end and a distal end;

connection means affixed to the proximate end of said tube connecting said tube to an oxygen supply for providing oxygen into said tube; and

said tube including:

an inside diameter between 1.7 and 2.5 millimeters to provide oxygen through said tube with an outside diameter substantially less than the cross-sectional area of the patient's trachea so not to interfere with spontaneous breathing of the patient;

a length sufficient to locate the proximate end of said tube external to the neck of the patient and to locate the distal end of said tube through a surgically formed opening in the trachea of said patient to an area above and adjacent the carina of the patient;

an opening formed in said distal end of said tube to disperse oxygen into the lungs of said patient without interfering with the normal breathing of said patient, and

a tube wall structure and thickness such as to enable flexible insertion of said tube into said trachea of said patient while resisting deformation of said tube.

5,181,510

FACIAL VAPORIZING DEVICE

Judith A. Peters, 226 Oak Park La., Pleasant Hill, Calif. 94523

Continuation-in-part of Ser. No. 534,162, Jun. 6, 1990, Pat. No. 5,094,237. This application Jan. 10, 1992, Ser. No. 818,612

The portion of the term of this patent subsequent to Mar. 10, 2009, has been disclaimed.

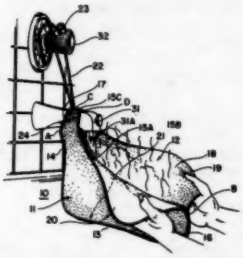
Int. Cl.[5] A61H *33/12*

U.S. Cl. 128—368 **19 Claims**

1. A portable facial vaporizing device comprising first and second opposing fabric sections joined together along a bottom edge thereof and along adjacent portions of back and front edges thereof to form an interior pocket adapted to contain a

volume of hot water in a bottom region thereof to produce warm water vapor arising from said volume of hot water.

hanging means defined by adjacent and adjoined upper back corner portions of said fabric sections for supporting said device on a spigot of a bathtub or sink such that hot water leaving said spigot will flow into said interior pocket and form a contained volume of hot water in said bottom region thereof.



at least a major portion of upper edge portions of said fabric sections being unjoined and forming an opening of a size sufficient for admitting the face of a person using the device into an upper region of said interior pocket above and spaced from said volume of hot water in said bottom region of said interior pocket such that a major portion of the person's face is exposed solely to warm water vapor from said volume of hot water and is not in contact with the hot water itself.

5,181,511

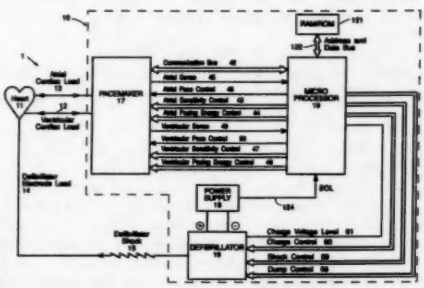
APPARATUS AND METHOD FOR ANTITACHYCARDIA PACING USING A VIRTUAL ELECTRODE

Peter Nickolls, Vaucluse, Australia; Richard M. T. Lu, Aurora, Colo.; Kenneth A. Collins, Neutral Bay, Australia; Roy M. McCulloch, Cherrybrook, Australia; Lucy M. Cheatle, Lane Cove, and Brian Cleland, Warrawee, all of Australia, assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Oct. 21, 1991, Ser. No. 780,753

Int. Cl.[5] A61N *1/36*

U.S. Cl. 128—419 PG **28 Claims**



1. An implantable device for treating cardiac arrhythmias in a patient's heart, comprising:

detecting means for detecting a tachycardia having a site of focus in the heart;

an electrode system including at least three electrodes for delivering antitachycardia pacing therapy to the heart;

means for determining the relative distances of said electrodes from said tachycardia focus site;

antitachycardia pacing therapy means for supplying antitachycardia pacing therapy to said electrodes;

orienting means responsive to said relative distances determining means for connecting at least three selected ones of said at least three electrodes to said antitachycardia pacing therapy means in such a manner as to create a virtual electrode at or near said tachycardia focus site when said antitachycardia pacing therapy is supplied to said selected electrodes; and,

means operative when said selected electrodes have been connected to said antitachycardia pacing therapy means for actuating said antitachycardia pacing therapy means to supply said antitachycardia pacing therapy to said selected electrodes.

5,181,512

LITHOTRIPTER INCLUDING A HOLDING DEVICE FOR AN ULTRASOUND LOCATING TRANSDUCER

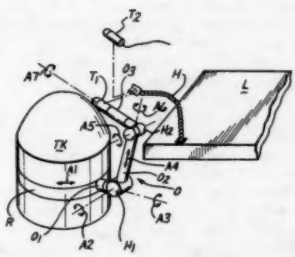
Thomas Viebach, Paehl; Rainer Kreibich; Bernd Nuber, both of Munich; Robert Pauker, Frontenhausen, and Alexander Hesse, Munich, all of Fed. Rep. of Germany, assignors to Dornier Medizintechnik GmbH, Fed. Rep. of Germany

Filed Dec. 17, 1990, Ser. No. 629,121

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1989, 3941683

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—660.03 **2 Claims**



1. In a lithotripter which includes a patient's rest, a therapeutic head means for producing shockwaves, an ultrasonic transducer, and a locating arm for movably mounting the ultrasonic transducer, and means for determining the position of the ultrasonic transducer as mounted on the locating arm in relation to the therapeutic head means including pivot motions and rotating motions around a center axis of the therapeutic head means; the improvement comprising:

the locating arm being mounted to the therapeutic head means and being of articulated construction;

a connecting and holding arm being affixed with one end to said patient's rest and being releasably connected with its other end to said transducer so that prior to a connection of the transducer to the holding arm the transducer is independent from the patient's rest, while upon connecting the ultrasonic transducer to the holding arm the transducer has also a position that is then fixed with reference to the patient's rest, and

the connecting and holding arm including means for retarding and braking any motion of the one end of the holding arm relative to the other end of the holding arm to thereby retard and brake any motion of the ultrasonic transducer when connected to the other end of the holding arm relative to the patient's rest.

5,181,513

METHOD OF ACQUIRING ULTRASOUND IMAGES

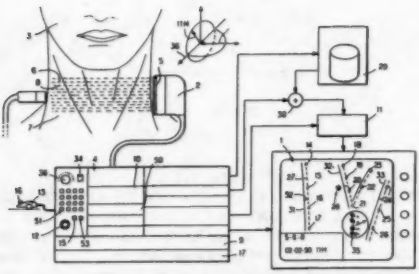
Pierre-Jean Touboul, 20 rue de Berri, 75008 Paris, and Siv-Cheng Tan, Saint Maur, both of France, assignors to Pierre-Jean Touboul, Paris and Traitement Synthese Image, Meudon la Foret, both of, France

Filed May 23, 1991, Ser. No. 704,800

Claims priority, application France, May 29, 1990, 90 06633

Int. Cl.[5] A61B *8/08*

U.S. Cl. 128—660.07 **7 Claims**



1. Method of acquiring medical ultrasound images using ultrasound equipment provided with a probe and a screen for displaying images produced in real time comprising the steps of:

a) acquiring at a first date with said equipment during a first examination of a patient a first image of a region of the body of said patient to be examined with a particular angle of incidence and inclination of said probe, said first image comprising contours of vascular structures; and

b) acquiring at a second subsequent date with said equipment during a second further examination of said patient a second image of said region of the body of said patient by the following steps:

1) producing on the display screen an image of contours of vascular structures from the first image;

2) manipulating said probe until vascular structures of the image of said region of the body, visible in real time on said display screen, are superimposed on the displayed contours of vascular structures from the first image; and

3) acquiring as said second image said displayed image when said superimposition is obtained, whereby the second image has substantially the same angle of incidence and inclination of the probe as the first image.

5,181,514

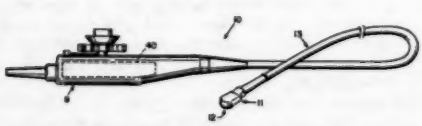
TRANSDUCER POSITIONING SYSTEM

Rodney J. Solomon, Needham; Martin K. Mason, Andover, both of Mass.; George Gruner, Everett, Wash., and James T. Fearnside, Lexington, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 21, 1991, Ser. No. 703,648

Int. Cl.[5] A61B *8/00*

U.S. Cl. 128—660.09 **31 Claims**



1. A endoscopic ultrasound probe for use with a remote ultrasound imaging system comprising:

a substantially planar rotatable transducer array within the distal end of said probe having a scan plane perpendicular to a plane of the array for obtaining a corresponding two-dimensional cross-sectional image relative to each position of the array;

a cable for connecting the array with remote ultrasound imaging system electronics; and

a positioning system which comprises an electrically powered motor for rotating the array about an axis perpendicular to said plane of the array to provide a plurality of scan planes for obtaining a plurality of corresponding two-dimensional cross-sectional images.

5,181,515

METHOD AND APPARATUS FOR MEASURING BLOOD PRESSURE

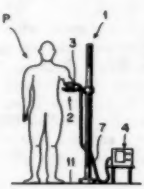
Kazuaki Negishi, Tokyo, Japan, assignor to Fukuda Denshi Co., Ltd., Tokyo, Japan

Filed May 28, 1991, Ser. No. 713,248

Claims priority, application Japan, Feb. 13, 1991, 3-042567

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—672 **6 Claims**



1. A method of measuring blood pressure of a subject P, comprising the steps of:

making said subject P squat down into a squatting position;

making the body of said subject P remain stationary for a fixed time in said squatting position;

making said subject P stand up from said squatting position into a standing position; and

measuring blood pressure of said subject P in said standing position.

5,181,516

INTERNAL PRESSURE MEASURING DEVICE USING CATHETER WITH MULTIPLE LUMENS

Masamitsu Sato, Akita, and Masami Tanishima, Tokyo, both of Japan, assignors to Nihon Kohden Corporation, Shinjuku, Japan

Filed Aug. 1, 1991, Ser. No. 748,083

Claims priority, application Japan, Aug. 27, 1990, 2-89301[U]; Nov. 5, 1990, 2-115404[U]

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—673 **5 Claims**

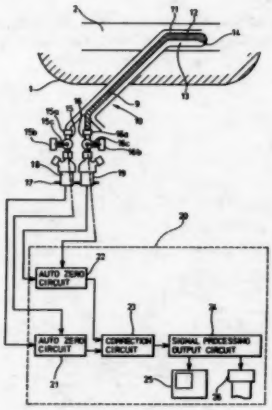
1. An internal pressure measuring device comprising:

an internal pressure measuring catheter constituted by at least three lumens which are an internal pressure measuring lumen whose distal end is open, a position correcting liquid-charged lumen whose distal end is closed and in which a liquid is charged, and a position correcting atmosphere-opened lumen whose proximal end is open to the atmosphere, said three lumens having adjoining peripheral surfaces, the liquid being brought into contact with the atmosphere at the distal end of said liquid-charged lumen and of said atmosphere-opened lumen;

an internal pressure measuring transducer connected to a proximal end of said internal pressure measuring lumen and a pressure measuring transducer connected to a proximal end of said position correcting liquid-charged lumen, both of said internal pressure measuring transducer and said pressure measuring transducer being mounted on a common base; and

an internal pressure measuring circuit portion for perform-

ing position correction on the output signal of said internal pressure measuring transducer using the output signal of said pressure measuring transducer to detect an internal pressure signal and for outputting the obtained internal pressure value to a display device or to a recording device,



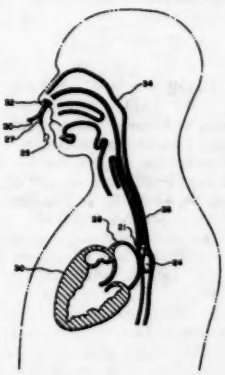
wherein the adjoining surfaces of the distal end portions of said liquid-charged lumen and said atmosphere-opened lumen have a small hole through which the charged liquid can be brought into contact with the atmosphere through said atmosphere-opened lumen.

5,181,517

METHOD AND APPARATUS FOR THE MEASUREMENT OF ATRIAL PRESSURE

Donald D. Hickey, Buffalo, N.Y., assignor to The State University of New York, Albany, N.Y.

Continuation-in-part of Ser. No. 409,041, Sep. 18, 1989, Pat. No. 5,048,532. This application Jun. 25, 1991, Ser. No. 717,854
Int. Cl.[5] A61B *05/02*
U.S. Cl. 128—673 **30 Claims**



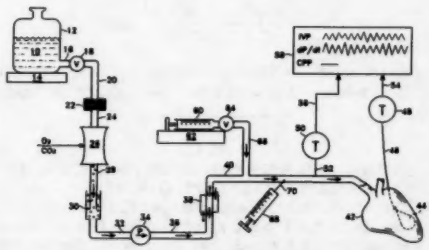
1. Apparatus comprising a catheter means which includes a balloon and is insertable into an esophagus for positioning said balloon adjacent the left atrium, means for inflating said balloon, and means for measuring the balloon pressure when the amplitude of balloon pressure oscillations effected by the left atrial pressure when said balloon is adjacent the left atrium is at a peak.

5,181,518

METHOD OF EVALUATING CARDIOPROTECTIVE AGENTS

Paul F. McDonagh, 4830 Camino La Brinca, Tucson, Ariz. 85724

Filed Feb. 4, 1991, Ser. No. 650,295
Int. Cl.[5] A61M *1/00*
U.S. Cl. 128—696 **21 Claims**



1. A bioassay model adapted for use with an isolated mammalian heart which mimics the human pathophysiologic process in order to screen experimental drugs and techniques for protection from ischemia-reperfusion injury comprising an extracorpeal coronary circuit comprising

(1) means for associating the mammalian heart with the model;

(2) a source of a first perfusate;

(3) a source of a second perfusate comprising whole blood;

(4) conduit means adapted for perfusing the first and second perfusates to the associated heart;

(5) means for determining and evaluating cardiac pump function comprising an inflatable balloon adapted for insertion within the left ventricle of the associated heart through the mitral valve and first transducer means communicating with the balloon by a first lead for monitoring cardiac pump action as a function of pressure within the balloon; and

(6) means for determining and evaluating coronary perfusion pressure comprising second transducer means communicating by a second lead with the conduit means for perfusing the first and second perfusate.

5,181,519

DEVICE FOR DETECTING ABNORMAL HEART MUSCLE ELECTRICAL ACTIVITY

Christopher T. Bible, Reno, Nev., assignor to Caliber Medical Corporation, Reno, Nev.

Filed May 17, 1991, Ser. No. 701,780
Int. Cl.[5] A61B *5/0468*
U.S. Cl. 128—704 **20 Claims**

1. An apparatus for monitoring heart muscle electrical activity of a patient comprising:

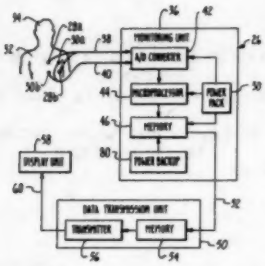
means positionable on the body of a patient for receiving electrical heart muscle signals generated by the patient;

means for establishing a reference axis relative to each of said signals;

means for identifying an ST segment in each of said signals;

means for measuring an ST deviation from said reference axis of each said ST segment and comparing said ST deviation to a predetermined threshold ST deviation; and

means for selectively storing an anomalous ST deviation when said anomalous ST deviation exceeds said predetermined threshold ST deviation and excluding ST deviations below said predetermined threshold ST deviation.



5,181,520

METHOD AND APPARATUS FOR ANALYZING AN ELECTRO-ENCEPHALOGRAM

David F. P. Wertheim, London; Rowena C. Oozeer, Northolt; Victor Dubowitz, London, all of England; John A. Connell, Reading, United Kingdom, and John W. E. Brydon, Melbourne, Australia, assignors to Royal Postgraduate Medical School, London, England

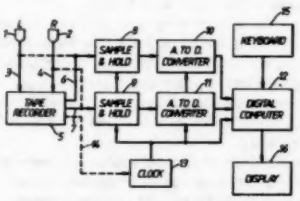
PCT No. PCT/GB88/01138, § 371 Date Aug. 2, 1990, § 102(e) Date Aug. 2, 1990, PCT Pub. No. WO89/05606, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 20, 1988, Ser. No. 548,970

Claims priority, application United Kingdom, Dec. 22, 1987, 8729899

Int. Cl.[5] A61B *5/0476*

U.S. Cl. 128—731 **22 Claims**



1. Apparatus for analyzing an electro-encephalogram (EEG) in which electrical signals derived from the EEG are applied to a threshold detector and threshold output signals are examined for a particular kind of brain activity, comprising:

input terminals for receiving at least two electrical signals respectively representing at least two channels of EEG which may be derived from different sides of a patient's head, wherein the two electrical signals are analyzed substantially simultaneously;

timing means for measuring time intervals between successive output signals produced by the threshold detector and for providing output values representing the time intervals;

selecting means for selecting only those output values that represent time intervals longer than a predetermined minimum time;

adding means for accumulating the selected output values representing time intervals occurring within a section of the EEG obtained during a time period of predetermined duration to produce a total value; and

display means for producing a visible output including a plurality of total values derived respectively from the EEG channels side by side obtained during consecutive time periods of the predetermined duration.

5,181,521

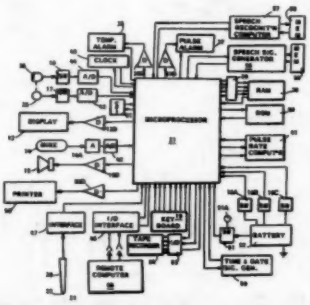
PORTABLE ELECTRONIC INSTRUMENT AND METHOD

Jerome H. Lemelson, Suite 286, 930 Tahoe Blvd, Unit 802, Princeton, N.J. 89451-9436

Continuation of Ser. No. 841,888, Mar. 20, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 117,809

Int. Cl.[5] A61B *5/02*

U.S. Cl. 128—736 **1 Claim**



1. A portable electronic thermometer in accordance with claim 1 wherein said third means is supported by said portable housing and includes a microphone for receiving sounds of select speech spoken in the vicinity of said housing, electronic speech recognition computing means within said housing and connected to receive, process and analyze the speech signals output by said microphone and generate respective coded electrical signals, said third means also including a memory containing recordings of codes indicative of the identity of a plurality of living beings whose temperatures are periodically caused to be sensed by said first means and means for addressing said memory with coded electrical signals generated when said speech recognition computing means recognizes select speech spoken into said microphone to cause select code signals to be generated on the output of said memory and to be recorded in said memory of said fifth means along with respective codes representative of temperatures generated on the output of said third means.

5,181,522

TOURNIQUET FOR SENSING AND REGULATION OF APPLIED PRESSURE

James A. McEwen, Richmond, Canada, assignor to Abatis Medical Technologies Limited, Dublin, Ireland

Continuation-in-part of Ser. No. 388,699, Jul. 13, 1989, Pat. No. 5,048,536, which is a continuation-in-part of Ser. No. 33,770, Apr. 3, 1987, Pat. No. 4,869,265. This application Sep. 13, 1991, Ser. No. 759,514

The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—748 **16 Claims**

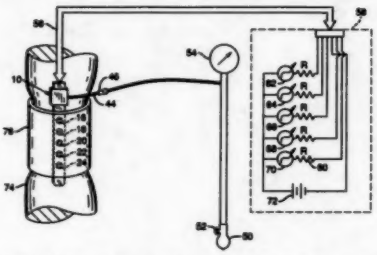
1. A tourniquet system comprising:

an inflatable occlusive band for encircling a limb of a subject and for inflating to apply pressure to the encircled limb to occlude blood flow into the limb distal to the band wherein an inner surface of the band faces the limb;

inflation pressure control means for controlling the pressure to which the occlusive band is inflated and for producing an inflation pressure signal representative of the pressure to which the band is inflated; and

applied pressure sensing means located at a predetermined

location fixed relative to the band for producing an applied pressure signal representative of the pressure applied



by the inflated band to the limb in a direction normal to inner surface of the band at the predetermined location.

5,181,523

BLOOD SAMPLING DEVICE WITH BLOOD-VIEWING CHAMBER

Dieter Wendelborn, Schwinderstrasse 62, 2090 Drage, Fed. Rep. of Germany

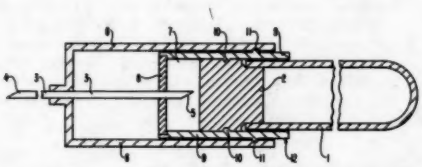
PCT No. PCT/EP90/02243, § 371 Date Sep. 13, 1991, § 102(e) Date Sep. 13, 1991, PCT Pub. No. WO91/10397, PCT Pub. Date Jul. 25, 1991

PCT Filed Dec. 19, 1990, Ser. No. 761,842

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1990, 4000968; Oct. 11, 1990, 4032274

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—764 **7 Claims**



1. A blood sampling device comprising the combination of a hollow needle pointed at both ends;

means for supporting said needle with a first end thereof positioned to enter a blood vessel of a patient;

a single pre-evacuated blood sample chamber having a central axis, said sample chamber slidable engaging said means for supporting said needle;

a single self-sealing stopper which can be pierced by said needle, said stopper being mounted at one end of said sample chamber; and

a blood observation chamber positioned axially toward said needle from said sample chamber, said observation chamber being closed at one end by said stopper and having a transparent side and a needle-piercable membrane closing an end away from said stopper, said observation chamber having an internal pressure substantially equal to ambient pressure;

said sample chamber and said observation being joined into a fixedly connected working unit substantially inseparable during the process of taking a blood sample and being separable for removing the blood sample.

5,181,524

NEEDLE GUARD FOR BLOOD COLLECTION

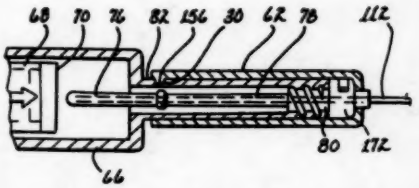
Alan A. Wanderer, Englewood, and William E. Sagstetter, Denver, both of Colo., assignors to Medical Safety Products, Inc., Denver, Colo.

Division of Ser. No. 353,898, Apr. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 918,020, Oct. 14, 1986, Pat. No. 4,731,059, and a continuation-in-part of Ser. No. 919,373, Oct. 16, 1986, Pat. No. 4,693,708. This application Sep. 26, 1991, Ser. No. 765,956

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.[5] A61B *5/00*; A61M *5/32*

U.S. Cl. 128—764 **3 Claims**



1. A phlebotomy device for use with a blood collection tube, said device comprising in combination: a blood collection needle having first and second ends, means for supporting said needle and for at least partially receiving the blood collection tube in penetrable engagement with the second end of said needle, threaded means for engaging and disengaging said needle with said supporting means, a guard having an open distal end and an open proximal end, the combination of said supporting means and said needle being axially translatable along said guard to permit axial protrusion of the first end of said needle through the open distal end of said guard and outwardly of and distally from said guard for penetrating tissue and a blood vessel during a phlebotomy procedure while the second end of said needle extends proximally into fluid communication with the blood collection tube to permit infusion of a flow of blood from the blood vessel through said needle into the blood collection tube, means interengaging said guard and the combination of said supporting means and said needle for relocating said guard to expose and enclose the first end of said needle through the distal open end of said guard, said interengaging means including a reversible detent means, said reversible detent means being configured to preclude distal translation of said guard in relation to the combination of said supporting means and said needle when a first force is applied to the first end of said needle during penetration of the first end of said needle into the tissue and the blood vessel during the phlebotomy procedure and to preclude proximal translation of said guard in relation to the combination of said supporting means and said needle when a second force is applied to the second end of said needle by the blood collection tube during the phlebotomy procedure, said interengaging means further including a protrusion extending from one of said guard and the combination of said supporting means and said needle and means for engaging said protrusion, said engaging means being disposed in the other of said guard and the combination of said supporting means and said needle, said engaging means including an axially oriented single pathway during exposure and enclosure of the first end of said needle, said protrusion and said engaging means being maintained in continuous interengagement and configured to preclude independent rotation of said guard relative to the combination of said supporting means and said needle during longitudinal axial translation of the combination of said supporting means and said needle relative to said guard and to preclude disengagement of said guard relative to the combination of said supporting means and said needle upon application of any opposed radially inwardly oriented forces applied during the phlebotomy procedure to

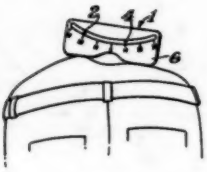
said guard distally of said protrusion and during relative translation between said engaging means and said protrusion means for restraining rectilinear disassembly of the combination of said supporting means and said needle from said guard.

5,181,525

SCOLIOSIS SCREENING DEVICE

William P. Bunnell, 9 Crestfield Rd., Wilmington, Del. 19810

Continuation of Ser. No. 598,531, Apr. 9, 1984, abandoned, which is a continuation of Ser. No. 417,865, Sep. 14, 1982, abandoned.
This application Apr. 25, 1989, Ser. No. 343,053
Int. Cl.[5] A61B *05/103*
U.S. Cl. 128—781 10 Claims



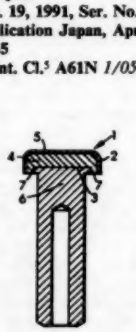
1. A device for measuring the angle of trunk rotation in a patient comprising:
- a backing plate having a U-shaped groove therein and an edge which contacts said patient during measurement, the U opening away from said edge of said plate which contacts said patient during measurement,
- a transparent U-tube affixed to said backing plate in said groove,
- said tube being filled with a fluid and containing a ball indicator,
- said edge of said plate which contacts the patient being generally straight and having a generally semi-circular indentation therein to accomodate the spinal column of the patient,
- said plate having indicia thereon to indicate the angle of trunk rotation, said angle being shown by the position of the ball indicator in said U-tube.

5,181,526

ELECTRODE FOR HUMAN HEART PACEMAKER

Haruki Yamasaki, Isehara, Japan, assignor to Tanaka Kikinzoku Kogyo K.K., Japan

Filed Apr. 19, 1991, Ser. No. 688,032
Claims priority, application Japan, Apr. 20, 1990, 2-104554; Apr. 20, 1990, 2-104555
Int. Cl.[5] A61N *1/05*
U.S. Cl. 128—784 1 Claim



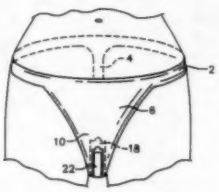
1. An electrode for a human heart pacemaker comprising an electrode substrate having an upper and lower portion, said electrode substrate formed of Pt, a Pt alloy, Ti or a Ti alloy, and a mixture of platinum and a platinum group metal oxide being coated thereon, the upper portion of the electrode being mesh or porous.

5,181,527

PROPHYLACTIC DEVICE

James C. Dorsey, 8328 46th Ave., SW., Seattle, Wash. 98136, and Johnnie L. Moore, 11390 NE. 36th Pl., #A 137, Bellevue, Wash. 98004

Filed Feb. 11, 1992, Ser. No. 833,929
Int. Cl.[5] A61F *5/42*
U.S. Cl. 128—830 11 Claims



1. A prophylactic device for preventing the exchange of bodily fluids, formed of elastic impermeable material, and adapted to be worn by a human female comprising:
- a first band portion adapted to be worn around the waist of a human female;
- a second band portion connected to said first band portion, said second band portion adapted to be worn between the buttocks of a human female such that the anus of the human female is covered by said second band portion;
- a genitalia shield portion connected to said first band portion and said second band portion, said genitalia shield portion having an inner side and an outer side, said genitalia shield portion adapted to cover the perineum of a human female, said genitalia shield portion including a sheath having an opening integral with said genitalia shield portion, said sheath having a retracted position in which the length of said sheath is diminished, said sheath adapted to be oriented adjacent to the vaginal opening of a human female when in said retracted position, said sheath having an extended position in which the length of said sheath is increased by placing a member against said opening of said sheath such that said sheath enters the vaginal opening of a human female and is oriented within the vagina; and
- a removable inner sealing means covering said sheath when said sheath is in said retracted position, said removable inner sealing means secured to said inner side of said genitalia shield portion to retain at least one of lubricant and spermicide adjacent the vaginal side of said sheath.

5,181,528

APPARATUS FOR EXTINGUISHING A LIGHTED CIGARETTE

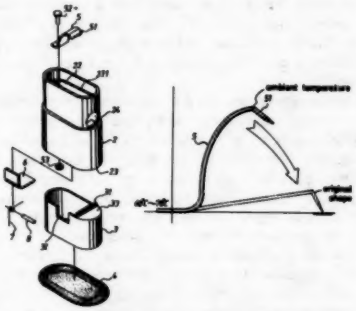
Hsing Chen; Horng-Show Koo; Li Chang, all of Hsinchu, and K. L. Shieh, Taipei, all of Taiwan, assignors to Industrial Technology Research Institute, Taiwan

Filed Oct. 4, 1991, Ser. No. 771,497
Int. Cl.[5] A24F *19/14*
U.S. Cl. 131—256 8 Claims

1. An apparatus for extinguishing a lighted cigarette butt comprising
- (a) a hollow outer seat (2) having a bottom opening and a cover (4) for selectively covering the bottom opening of the seat (2); wherein the outer seat (2) is partitioned into an upper blocking chamber (22) and a lower storing chamber (23) by a partitioning wall (21), and a communicating path (211) is formed between the blocking chamber (22) and the storing chamber (23); a cigarette hole (24) being provided at one lateral side of the blocking chamber (22) for receiving a cigarette;
- (b) a storing container (3) which is detachably secured within the interior of said hollow seat (2) through the bottom opening in said seat
- (c) a blade (5) which is arch-shaped and has a sawtooth-like

structure (51), said blade being positioned on the partitioning wall (21), and a second sawtooth-like structure (31) being positioned across a top of said container (3); and

(d) an L-shaped plate (6) being mounted on an internal wall within the blocking chamber (22) for the blocking of the communicating path (211), and a spring (7) being mounted at a position on the internal wall of said blocking chamber (22) to urge a bottom end of the L-shaped plate (6) toward



a closed position; wherein said blade (5) and plate (6) are made from shape memory alloys having different temperature reaction gradients,

whereby the insertion of a lighted cigarette via said hole and attendant heat created by said lighted cigarette (24) causes the blade (5) to cut the lighted portion of the cigarette and then press against plate (6) to extinguish the lighted cut-off portion of the cigarette.

5,181,529

KIT AND TWO-STEP COSMETIC TREATMENT FOR HAIR

David Roberts, 7241 Mission Hill Dr., Las Vegas, Nev. 89113

Filed Jul. 18, 1991, Ser. No. 732,468
Int. Cl.[5] A61K *7/06, 7/08*
U.S. Cl. 132—209 **20 Claims**

10. A process for beautifying and grooming hair which comprises separately applying to the hair a hair treatment concentrate and a hair setting mousse; the hair treatment concentrate comprising (i) about 0.08 to about 9% by weight of aged or unaged glyoxal, (ii) about 0.2 to about 9% by weight of urea or thiourea, and (iii), as an inert carrier, water, a lower alkanol, or a mixture thereof; the hair setting mousse comprising (i) an effective amount of the hair treatment concentrate, (ii) an effective amount of a propellant, (iii) an effective amount of an alcohol, and (iv) an effective amount of a foaming agent.

5,181,530

HAIR CLIP

Kuo-Hua Chou, 9-1, Lane 161, Hsing An Road Sec. 1, Taichung, Taiwan

Filed Nov. 29, 1991, Ser. No. 800,470
Int. Cl.[5] A45D *8/22*
U.S. Cl. 132—279 **12 Claims**

1. A barrette comprising an elongate arched plastic holder and an elongate arched metal clip member carrying a clamping assembly for clamping a tress of hair, wherein:

longitudinal end portions of said holder are folded into abutment with a concave side of said holder to define respective fold portions;

an embossed protrusion is formed on each said fold portion adjacent with a lateral periphery thereon, each said protrusion being spaced from said holder to define respective receiving cavities;

each said receiving cavity has an entrance slit formed along said lateral periphery of a corresponding said fold portion for intromitting a longitudinal end portion of said clip member into said receiving cavity in a substantially lateral direction with respect to said holder;

a snap engaging means is provided between each said end portion of said clip member and a corresponding said

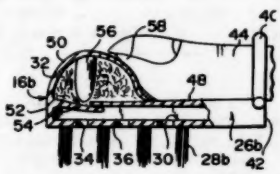
receiving cavity for securing said end portion of said clip member therein, each said snap engaging means including at least one elastic appendage which engages a cooperating surface to inhibit the retraction of a said end portion of said clip member from a corresponding said receiving cavity.

5,181,531

TOOTH CLEANING KIT FOR VENDING MACHINES

Dario Escoto, 261 Seaman Ave. #10-A, New York, N.Y. 10034, and George Spector, 233 Broadway Room 3815, New York, N.Y. 10007

Filed Jul. 18, 1991, Ser. No. 732,484
Int. Cl.[5] A46B *11/00*
U.S. Cl. 132—308 **1 Claim**



1. A tooth cleaning kit for a vending machine which comprises:

a) a small package to be dispensed form the vending machine;

b) a toothbrush sealed in said small package;

c) a small tube of toothpaste sealed in said small package;

d) a napkin sealed on said small package;

e) a piece of dental floss sealed in said small package so that a person can purchase, use and then dispose said tooth cleaning kit, wherein said tooth brush includes:

f) a generally flat head with an underside having a compressible compartment for storage of toothpaste therein and there a plurality of apertures on the underside of said flat head;

g) a plurality of bristles extending from the underside of said flat head for cleaning he teeth;

h) a band affixed to the rearward end of said flat head and curving upwardly therefrom so that a finger of a hand of the person can be inserted between said band and the top surface of said flat head;

i) a compressible bubble segment formed on the forward end of said flat head above said compartment for storage of he toothpaste therein;

j) a one way valve in the forward end of said flat head below said bubble segment; and

k) a plunger in said compressible bubble segment aligned with said one way valve whereby compression of said bubble segment by the users finger causes said plunger to

open said valve and simultaneously force toothpaste from said bubble segment into said compartment and out of said apertures to said bristles.

5,181,532
FLOW CONTROL

Lage Brodefors, Terrassgatan 15, S-411 33 Göteborg, and Lars Irstam, Lilla Askimsvägen 6, S-436 00 Askim, both of Sweden

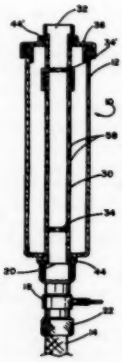
Continuation of Ser. No. 674,364, Apr. 16, 1991, abandoned. This application Apr. 20, 1992, Ser. No. 871,837
Claims priority, application Sweden, Sep. 16, 1988, 8803272
Int. Cl.[5] G05D *7/01*
U.S. Cl. 137—14 **6 Claims**

1. A method of setting an adjustable flow for a specific fluid flowing through a pipe, by arranging an exchangeable porous body having predetemriend liquid through-flow characteristics in a container coupled to the pipe, said container corresponding to the body, the method comprising the steps of prefabricating various series of porous bodies having various fluid through-flow characteristics, providing the various series of bodies with marking corresponding to a certain maximum flow, the container being transparent to enable the marking on the body to be inspected after insertion in said container.

5,181,533
CONTROLLED DISPENSER

Rick F. Kooi, 11802 Bexhill, Houston, Tex. 77065

Filed Nov. 8, 1991, Ser. No. 790,187
Int. Cl.[5] B05B *7/26*; **B01F** *1/00*
U.S. Cl. 137—268 **5 Claims**



1. A controllable dispenser for dispensing an aqueous solution comprised of:

a container of integral, one piece construction throughout its length and having a water inlet opening and a solution outlet opening,

means for connecting said inlet to a source of water and a means for connecting said outlet to a solution discharge device,

valve means directly adjacent said water inlet opening to control water entering into said inlet opening,

a centrally disposed perforated chamber within said container having two ends longitudinally communicating with said inlet opening at one end and said outlet opening at the other end, said chamber holding soluble material, said chamber further having a removable cap disposed adjacent the said other end of said chamber, nearest the outlet opening, whereby said chamber may be filled with a soluble substance, said chamber removable cap further having a depending peripheral skirt fitted over said chamber other end,

an intermediate passage defined by an inner surface of said container and an outer surface of said chamber,

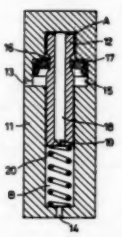
access means to said chamber to fill said chamber with a soluble material, said access means comprising a removable threaded cap mated to a corresponding threaded portion of said container, said chamber removable cap having an upper end interfitted concentrically within said access means removable threaded cap, and

at least two orifices disposed within said chamber, one orifice adjacent the end nearest the inlet opening and one orifice adjacent the end nearest the outlet opening and being located within said chamber removable cap, adjacent said chamber other end, to offer a regulated fluid flow to communicate with said chamber and said passage, whereby said source of water enters through said valve body into said container, a portion of said water enters through said orifice adjacent said inlet opening and a portion enters into said passage, said flow is then permitted to exit said chamber through said perforations and enter into said passage, said flow is finally permitted to exit said chamber through said orifice adjacent said outlet opening and is permitted to mix with said flow exiting said passage adjacent said outlet opening to said discharge device.

5,181,534
FLOW CONTROL VALVE

Koichi Hashida, and Koji Takata, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 640,624, Dec. 21, 1990, abandoned. This application Mar. 27, 1992, Ser. No. 858,517
Claims priority, application Japan, Dec. 21, 1989, 1-333583; Feb. 8, 1990, 2-31198
Int. Cl.[5] G05D *7/01*
U.S. Cl. 137—501 **9 Claims**



1. A flow control valve comprising:

a sleeve defining an inlet port open at the exterior thereof, an outlet port open at the exterior thereof, and an annular groove in the inner periphery thereof;

a spool fitted in said sleeve, said spool and said sleeve defining a high pressure chamber at one end of the spool and a low pressure chamber at the other end of the spool, said spool having a portion between the ends thereof in a liquid-tight sliding engagement with the inner periphery

of said sleeve, and said spool having a shoulder portion defining an annular groove in the outer periphery thereof;

a fluid passage having a flow restriction orifice therein and extending between said high and said low pressure chambers;

biasing means for biasing said spool in a direction opposite to that in which a force acts on the spool when pressure in the high pressure chamber exceeds that in the low pressure chamber; and

an annular seal of soft resilient material liquid-tightly fitted in said annular groove in the inner periphery of said sleeve, said annular seal having an inner peripheral portion extending into said the annular groove in said spool with a gap therebetween,

fluid communication between said inlet and said outlet ports through said orifice being established through said gap when the pressure differential at said ends of the spool is less than the force exerted on the spool by said biasing means, and said shoulder portion of said spool engaging said annular seal to effect a seal against said fluid communication when said pressure differential is greater than the force exerted on the spool by said biasing means, whereby the pressure differential at said ends of the spool is maintained at a value corresponding to the force exerted on the spool by said biasing means, and the flow rate of fluid between said inlet and said output ports is maintained at a value corresponding to the flow rate through said orifice.

5,181,535

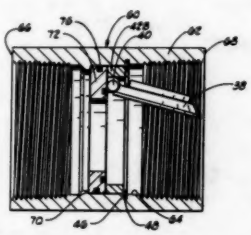
COMPACT SWING CHECK VALVE

John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170

Division of Ser. No. 783,722, Oct. 25, 1991, which is a continuation of Ser. No. 430,169, Nov. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 286,979, Dec. 20, 1988, Pat. No. 4,982,759. This application Jun. 2, 1992, Ser. No. 893,218

Int. Cl.[5] F16K *15/03*

U.S. Cl. 137—515.5 **6 Claims**



1. A swing check valve, comprising:

a body having upstream and downstream ends and a bore therethrough interconnecting the upstream and downstream ends, the bore having an annular shoulder facing downstream and an annular groove located downstream from the annular shoulder thereof;

a seat ring in the bore insertable through the downstream end of the bore and having an upstream end, a downstream end, an annular shoulder on the outer periphery thereof facing upstream, and a valve seat portion providing a seating face facing downstream;

a cage ring in the bore insertable through the downstream end of the bore and having upstream and downstream ends, the upstream end of the cage ring being sized to engage the downstream end of the seat ring to retain the cage ring downstream from the seat ring in the bore;

a disc pivotally supported by the cage ring and sized to mate with the seating face to prevent flow upstream through the valve; and

a retainer ring mounted in the annular groove in the bore and engaging the downstream end of the cage ring to hold the cage ring and the seat ring against downstream movement in the body;

wherein the annular shoulder of bore mates with the annular shoulder on the seat ring to prevent upstream movement of the seat ring and the cage ring and wherein the annular shoulder of the bore is positioned to locate the downstream end of the cage ring in spaced relation from the downstream end of the body.

5,181,536

COOLANT CORROSIVENESS INDICATOR

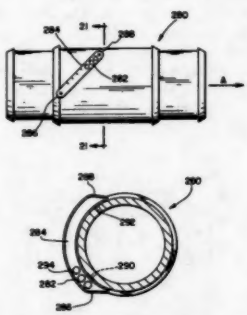
Charles S. Argyle, Willowdale; Brian E. Cheadle, Bramalea, both of Canada, and Steven L. M. Bokor, Rochester Hills, Mich., assignors to Long Manufacturing Limited, Oakville, Canada

Division of Ser. No. 610,804, Nov. 8, 1990, Pat. No. 5,127,433. This application Jan. 16, 1992, Ser. No. 821,631

Claims priority, application Canada, Apr. 19, 1990, 2014982

Int. Cl.[5] F16K *37/00*; **F28F** *19/00*; **G01D** *21/00*

U.S. Cl. 137—559 **8 Claims**



1. A corrosion sensor for a heat exchange system comprising:

support means for mounting the sensor in said system to enable the sensor to contact heat exchanging fluid flowing through the system;

a transparent viewing member mounted in said support means; and

visual indicating means, which can be viewed through said viewing member, having a corrodible opaque coating thereon and located so that said heat exchanging fluid contacts said coating during use of the sensor, wherein said visual indicating means changes its colour when said coating is at least partially removed by corrosion caused by said heat exchanging fluid.

5,181,537

OUTLET COLLECTORS THAT ARE RATE INSENSITIVE

Maston L. Powers, Oklahoma City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Division of Ser. No. 749,017, Aug. 23, 1991, Pat. No. 5,103,863, which is a continuation of Ser. No. 450,349, Dec. 12, 1989, abandoned. This application Feb. 3, 1992, Ser. No. 830,393

Int. Cl.[5] F03B *11/00*

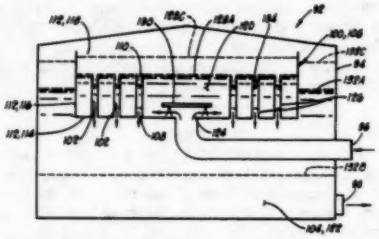
U.S. Cl. 137—561 A **4 Claims**

1. A fluid handling apparatus comprising:

a vessel having a vessel interior;

an outlet collector disposed in said vessel, said collector including a bottom and a plurality of flow tubes disposed through said bottom and extending into a collector interior of said collector, said flow tubes all having substantially identical lengths and substantially identical diameters, each of said flow tubes having an upper end open to said collector interior and a lower end open to said vessel

interior, said upper ends of all of said flow tubes being at substantially identical elevations; and



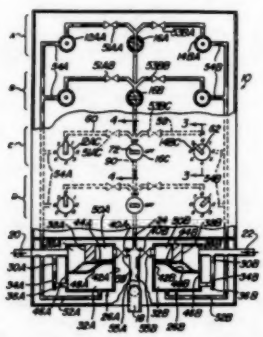
level control means for maintaining a liquid level in said collector interior below said upper ends of said flow tubes.

5,181,538

MULTIPLE STREAM FLUID MIXING AND DISPENSING APPARATUS

Paul R. Manganaro, P.O. Box 535, Coopersburg, Pa. 18036

Continuation-in-part of Ser. No. 448,639, Dec. 11, 1989, Pat. No. 4,991,625. This application Feb. 11, 1991, Ser. No. 654,197
The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.
Int. Cl.[5] F16K *11/18*
U.S. Cl. 137—607 **10 Claims**



1. A plural station, fluid flow rate and temperature control console adapted for cooperating with the standing pneumatic/-hydraulic pressure of a dual temperature fluid supply means, comprising:

(a) two main fluid supply conduits, a single fluid exit conduit interruptably connectable to both of said supply conduits, a variable affluent flow rate regulator interposed in each of the said main supply conduits, a bypass fluid supply conduit operably connected to each of the main fluid supply conduits and to the interposed flow rate regulators, an ancillary fluid outlet conduit connected to each regulator and serving as a signal control fluid supply means, and at least one associated controller means for presetting the flow rate through each regulator and determining both the degree of mixing and the incidence of the fluid flow to be provided from said supply conduits to the exit conduit;

(b) each of the flow rate regulators comprising a rigid fluid-impermeable main chamber connecting at a first section thereof with one of the main fluid supply conduits and with said fluid exit conduit, said bypass fluid supply conduit being operably connected between each of said main supply conduits and a second section of the main chamber of the interposed flow rate regulators;

(c) said main chamber having a first fluid valving means comprising one or more flow control ports upstream of said fluid exit conduit, a variable position flow closure means separating said first and second sections of said main chamber and adapted for effecting reciprocating valving motion across said flow control ports ranging between a full-flow and no-flow position responsive to the differential pressures created on the opposite sides of said flow closure means by the dissimilar flow pressures exerted from the main fluid supply conduit and the bypass fluid supply conduit;

(b) a manually adjustable needle valve located in the bypass fluid supply conduit of each flow rate regulator for purposes of calibrating the desired pressure drop occurring in the supply fluid passing therethrough to the second section of the main chamber of each regulator, which supply fluid exerts pressure on the undersurface of the flow closure means;

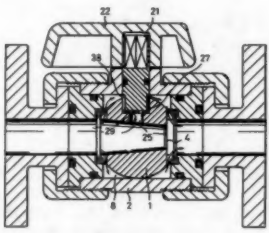
(e) said at least one associated controller means is adapted for setting the regulator main flow rate comprising a first multisetting flow valve means disposed downstream in the signal control fluid supply means disposed downstream in the signal control fluid supply means, and a second valving means connectably disposed downstream of the first multisetting valve means and being adapted to only "ON" or "OFF" modes of operation, said second valving means also being connected to a second companion multisetting flow valve means associated with the other signal control fluid supply means of the other flow rate regulator and also to said main exit conduit, and serving as a common signal flow control valve for the mixed fluid streams.

5,181,539

BALL VALVE

Ikuo Yokoyama, Nobeoka, Japan, assignor to Asahi Yukizai Kogyo Co., Ltd., Japan

PCT No. PCT/JP90/01651, § 371 Date Aug. 19, 1991, § 102(e) Date Aug. 19, 1991, PCT Pub. No. WO91/09243, PCT Pub. Date Jun. 27, 1991
PCT Filed Dec. 18, 1990, Ser. No. 743,375
Claims priority, application Japan, Dec. 19, 1989, 1-327372; Jun. 6, 1990, 2-146336
Int. Cl.[5] F16K *5/06*
U.S. Cl. 137—625.32 **11 Claims**



1. A ball valve comprising:

a valve body having a valve chest space between an upstream and a downsteam side of the valve body;

a ball having a passage therethrough, the ball being rotatably fitted in the valve chest space so that an upstream and a downstream end of the passage are communicable with the upstream and downstream sides of the valve body, the ball being formed with a ball groove for receiving a stem flange;

an orifice provided at the downstream end of the passage in the ball; and

a stem flange, the stem flange being fitted in the ball groove and forming, with the ball groove, a flange groove,

an upstream communicating portion being provided upstream from the orifice at the upstream end of the passage and communicating with the passage and the valve chest

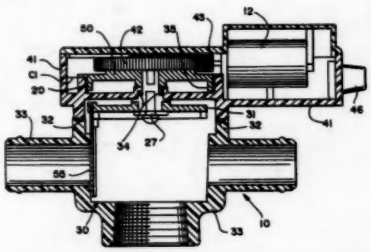
space, a downstream communicating portion being provided downstream from the orifice at the downstream end of the passage and communicating with the passage and the valve chest space, and a communicating hole being provided at an approximate center portion of the passage in the ball and communicating with the valve chest space through the flange groove.

5,181,540

ELECTRIC MULTI-POINT POSITIONER

Daniel N. Campau, Grand Rapids, Mich., assignor to Flow-Rite Controls, Ltd., Grand Rapids, Mich.

Division of Ser. No. 723,754, Jul. 1, 1991. This application Mar. 31, 1992, Ser. No. 861,297
Int. Cl.[5] A16K *5/00*
U.S. Cl. 137—625.46 **8 Claims**



1. An apparatus for indexing a rotary component which controls the rotation of one or more flexible sealing flappers adapted to seal one or more ports within a multi-port valve, for use in a water distribution system between a water source and a livewell in a boat, the valve including a valve chamber defined by a top wall, a bottom wall, a cylindrical sidewall and two or more ports communicating with the chamber, comprising:

(a) a housing having a sidewall defining an internal periphery, said housing sidewall supporting a plurality of indexing electrical contacts spaced circumferentially around said internal periphery;

(b) a rotatable, electrically conductive, annular band contained within said housing and operatively connected to the rotary component, said band being configured to have a first band portion which slidably engages said indexing contacts and a second band portion which is not engageable with said indexing contacts;

(c) at least one bridging electrical contact adapted to remain in electrical engagement with said band throughout the rotation of said band;

(d) electrically actuated drive means for rotating said band within said housing; and

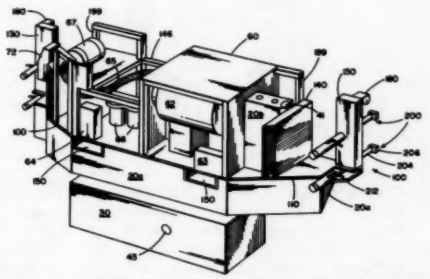
(e) electrical circuit means, including an electrical supply means and switching means, for selecting one indexing contact and applying power through said drive means to rotate said band and the rotary component until said band disengages from the selected one of said indexing contacts, thereby simultaneously halting further movement of the rotary component.

5,181,541

MULTI-TANK FUEL STORAGE SYSTEM FOR REFRIGERATED FREIGHT CONTAINER ELECTRIC GENERATORE

Bert A. Bodenheimer, Stamford, Conn., assignor to B.A. Bodenheimer & Co., Inc., Stamford, Conn.

Continuation of Ser. No. 475,805, Feb. 6, 1990, abandoned. This application Dec. 13, 1991, Ser. No. 807,795
Int. Cl.[5] A01G *25/09*
U.S. Cl. 137—899 **24 Claims**



1. A multi-tank fuel storage system for a refrigerated freight container generator unit which has a generator unit housing frame which can be mounted to at least one of, a container in a clip-on fashion where said generator unit housing frame extends adjacently forward said container but is spaced behind a truck cab pulling a chassis which supports said container to permit swing clearance of said truck cab, or said chassis supporting the container in an underslung fashion where said generator unit housing frame is extends under said chassis but above the ground over which said chassis extends in a manner providing sufficient ground clearance, the multi-tank fuel storage system comprising:

a) said generator unit housing frame, including a first fuel storage tank built into said generator unit housing frame;

b) a separate second fuel storage tank which is nonintegral with said generator unit housing frame, and which, when said housing frame can be mounted to said container in a clip-on fashion, also extends adjacently forward said container but is spaced behind said truck cab pulling said chassis which supports said container to permit swing clearance of said truck cab, and when said housing frame can be mounted to said chassis in an underslung fashion, also extends under said chassis but above the ground over which said chassis extends in a manner providing sufficient ground clearance;

c) first fluid conduit means coupling said first fuel storage tank and said separate second fuel storage tank; and

d) second fluid conduit means coupling one of said first and second fuel storage tanks and an engine of said generator unit.

5,181,542

ORIFICE SYSTEM MOUNTING ASSEMBLY

Donald J. Wass, and Anthony E. Carter, both of Houston, Tex., assignors to Daniel Industries, Inc., Houston, Tex.

Filed Feb. 22, 1991, Ser. No. 659,989
Int. Cl.[5] F15D *1/02*
U.S. Cl. 138—44 **11 Claims**

1. An orifice plate holding system for use with a fitting having a passage and

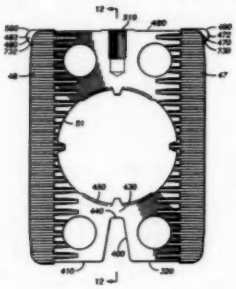
an orifice plate having an outer circumference and

a seal surrounding said outer circumference, comprising:

a rectangular shaped plate carrying device having means for introduction into the fitting and having a first end, a sec-

ond end, sides and an interior opening sized to receive said orifice plate and said surrounding seal thereon;

said first end having a first end conical cross-section opening therein extending substantially into the interior of said plate carrying device, said first end conical cross-section opening being separated from said interior opening;



each of said sides having an ear extending outwardly from the plane of said side, the exterior portion of said ears being substantially adjacent to said second end said conical opening and said ears cooperating with portions of the fitting to center said orifice plate within the fitting.

5,181,543

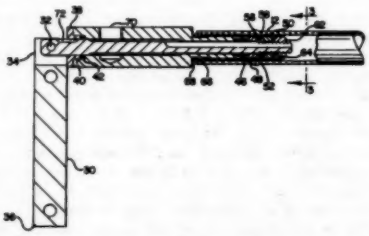
TUBE TESTING CONNECTOR

Adam J. Hendzel, Brookfield, Ill., assignor to Tuthill Corporation, Hinsdale, Ill.

Filed Aug. 22, 1991, Ser. No. 748,532

Int. Cl.[5] F16L *55/10*; G01M *3/14*

U.S. Cl. 138—90 **8 Claims**



1. A tube testing device for insertion into open ended tubing for sealing one end thereof, said device including a body member having an axial bore and a terminal portion adapted to be inserted into the open end of a tube; a stem shiftably disposed in said bore, said stem having a first end adapted to enter the tube and a second opposite end adapted to remain out of the tube; handle means secured to said stem to move said stem between a first non-sealing position and a second sealing position; a first seal member mounted adjacent said terminal portion of said body member, said first seal member being made of a compressible resilient material to increase its outer diameter when compressed laterally so as to engage the inner periphery of the tube and seal against the escape of pressurized fluid; actuating means connected to said stem and engageable against said first seal member such that when said stem moves from said non-sealing position to said sealing position said actuating means laterally compresses said first seal member so as to increase its outer diameter to effect sealing engagement with the tube; a port defined in said body member adapted to communicate pressurized fluid from a pressure source to said axial bore; a second seal member surrounding said stem toward said second end thereof to seal against the escape of pressurized fluid from said bore when said stem is in said sealing position; and a pressure relief groove formed in said stem toward said second end, said groove positioned such that when said stem moves from said sealing position to said non-sealing position, portions of said groove lie on either side of said second seal member thereby providing an exhaust passage for pressurized fluid from said axial bore, prior to removal of the tube being tested.

5,181,544

DELIVERY DEVICE WITH AUTOMATIC THREADING SYSTEM FOR WEFT STORAGE DRUM

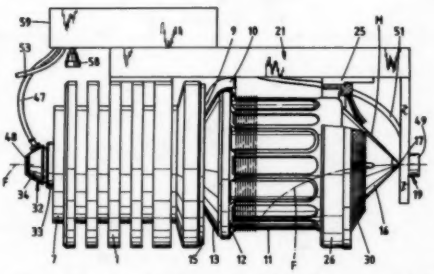
Adriano Deiuri, Taverne, Switzerland, assignor to SOBREVIN Société de brevets industriels-Etablissement, Vaduz, Liechtenstein

Filed Jan. 29, 1991, Ser. No. 647,052

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1990, 4007131

Int. Cl.[5] D03D *47/34*

U.S. Cl. 139—452 **16 Claims**



1. In a delivery device for traveling thread, for use on textile machines having a storage drum to which the thread is fed in a rearward region by means of a thread guide tube which revolves around the storage drum and from which the thread is withdrawn overhead through a thread withdrawal eye and wherein an automatic threading of the thread is effected by means of compressed air in a manner wherein the thread is first of all blown through the thread guide tube, deflected at an exit mouth side thereof parallel to an outer surface of the drum and conducted on an end side thereof below bristles of a displaceable brake ring which leaves a slot towards the outer surface of the drum, radially inwardly into a region of a tip of a drum-side head cone, said tip being directed towards a free cross section of the thread withdrawal eye, the latter being formed as an axial suction-blast nozzle, the improvement in the delivery device further comprising

means comprising a curved surface which extends in a direction of blowing of the thread into a horizontal surface for deflecting the thread at said exit mouth side of said thread guide tube with the latter being obliquely upwardly directed during the automatic threading of the thread,

said axial suction-blast nozzle constitutes means for effecting a radially inward deflection directed towards the thread withdrawal eye of an end of the thread flying free in a plane vertically above the thread withdrawal eye exclusively by a stream of suction air along an outer surface of the head cone, and wherein

said outer surface of the head cone extends from said plane and forms a linear guide surface for the end of the thread, said linear guide surface extending from the outer surface of the drum to the tip of the head cone, and

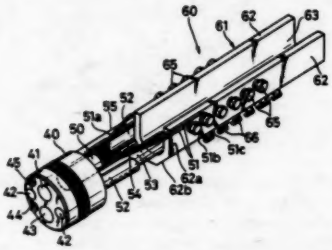
said bristles of said brake ring form a skirt adjacent an upper section of said head cone.

5,181,545

ENDOSCOPE AND JIG FOR PROCESSING SIGNAL CONDUCTORS OF ENDOSCOPE

Nobuo Koshikawa, Arakawa, and Masahiro Inoue, Shinagawa, both of Japan, assignors to Kabushiki Kaisha Machida Seisakusho, Tokyo, Japan

Division of Ser. No. 530,406, May 30, 1990, Pat. No. 5,003,964. This application Jan. 15, 1991, Ser. No. 641,647
Claims priority, application Japan, Jun. 15, 1989, 1-69053
Int. Cl.[5] B21F *1/00*
U.S. Cl. 140—92.1 **5 Claims**



1. A jig for processing signal conductors extending from an electric device attached to a rigid portion provided at a distal end of an endoscope, comprising:

(a) an elongated base; and

(b) a plurality of pairs of first and second engagement portions provided on each of opposite sides of said base, said pairs of first and second engagement portions being spaced from each other in a direction intersecting a longitudinal direction of said base, said first engagement portions being arranged substantially in a row and spaced from one another in the longitudinal direction of said base, and said second engagement portions being arranged substantially in a row and spaced from each other in the longitudinal direction of said base;

(c) said signal conductors extending from said electric device being adapted to be divided into two groups which are disposed respectively adjacent to the opposite sides of said base, each of said signal conductors being engaged with a respective one of said pairs of said first and second engagement portions, said signal conductor being engaged with the corresponding first engagement portion to be directed toward the corresponding second engagement portion, and further engaged with said corresponding second engagement portion to extend in the longitudinal direction of said base.

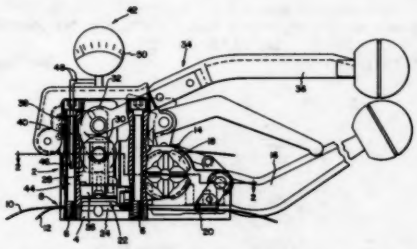
5,181,546

BANDING APPARATUS

Wenzel Synek, Rudolfstetten, Switzerland, assignor to Fromm Holding AG, Cham, Switzerland

Filed Aug. 26, 1991, Ser. No. 749,566
Claims priority, application Switzerland, Jun. 7, 1991, 1714/91
Int. Cl.[5] B21F *9/02*
U.S. Cl. 140—93.4 **8 Claims**

1. A banding apparatus comprising: a band tightening device, tool means for connecting two overlapping band sections including an upper tool part movable by means of a drive device against a lower tool part which is arranged on a base plate, wherein between the base plate and a housing there exists a sideways open slot for receiving overlapping band sections, and wherein the base plate is connected with the



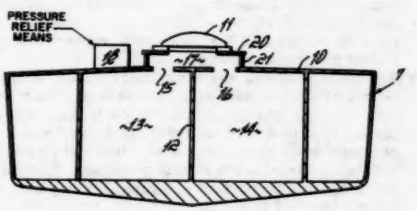
housing by means of two expansion screws having an expansion shaft section.

5,181,547

LIQUID SPILL DEVICE ARRANGEMENT FOR LIQUID TRANSFER IN A CLOSED SYSTEM

Fontain M. Johnson, Cincinnati, Ohio, assignor to Midland Enterprises Inc., Cincinnati, Ohio

Filed Sep. 27, 1991, Ser. No. 766,850
Int. Cl.[5] B65B *31/00*
U.S. Cl. 141—46 **9 Claims**



1. A liquid spill device arrangement for use in a closed liquid transfer system from a sender facility to a receiver vessel comprising

a receiver vessel having multiple tanks for containment of liquid with a common boundary between said tanks, said receiving vessel for receiving liquid from the sender facility and for transfer of gas/vapor from the receiver vessel to the sender facility,

a pressure relief means for venting gas/vapor at a selected relief pressure from the receiver vessel to atmosphere,

said tanks having an opening therein near their tops in proximity to said common boundary,

a closed trunk connecting said tanks through said opening and allowing liquid to flow from one tank to another,

a liquid spill device mounted to said trunk in communication with said tanks, said spill device for opening at a pressure allowing overfill liquid to flow from containment in said tanks to prevent exceeding their structural design pressure,

said liquid spill device opening at a pressure equal to or greater than said selected gas/vapor relief pressure of the receiver vessel.

5,181,548

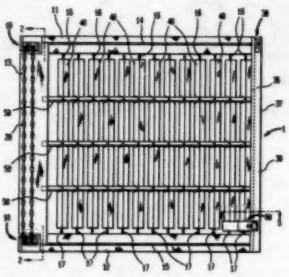
EMERGENCY EXIT SECURITY WINDOW BLINDS

Arthur J. Matthews, 631 Columbia Ave., Atco, N.J. 08004

Continuation-in-part of Ser. No. 523,200, Apr. 2, 1990, which is a continuation-in-part of Ser. No. 419,460, Oct. 10, 1989, abandoned. This application Aug. 13, 1990, Ser. No. 566,067

Int. Cl.[5] E06B *9/30*

U.S. Cl. 160—172 **10 Claims**



1. A window security system comprising, in combination

a system frame assembly, said frame assembly comprising an upper frame member, a lower frame member, a first side frame member and a second side frame member, said upper frame member and said lower frame member being disposed in parallel alignment with each other and including means for rotatably receipt of a plurality of blind slats disposed therebetween, said first side frame member being attached at one end of the respective upper and lower frame members, said second side frame member being attached at the opposite end of the respective upper and lower frame member, said first side frame member including one or a plurality of slots for respective receipt of a locking rod, said second side frame member including one or a plurality of holes for respective receipt of said locking rod, said second side frame member further including means to selectively retain said one or a plurality of locking rods within said first side frame member and said second side frame member;

a plurality of blind slats attached to said means for rotatable receipt included in said upper and lower frame members, said blind slats having a plurality of slots formed therein in parallel alignment with said upper and lower frame members suitable for receipt of a locking rod, said plurality of slots being formed in a manner to permit said blind slats to be rotated into interlocking engagement having said locking rod received therein; and

a plurality of locking rods of sufficient length and size to extend between the slots of said first side frame member and the holes of said second side frame member through the apertures of said blind slats.

5,181,549

METHOD FOR MANUFACTURING POROUS ARTICLES

Vladimir I. Shapovalov, Dnepropetrovsk, U1. Chernyshevskogo, U.S.S.R., assignor to Dmk Tek, Inc., Ann Arbor, Mich.

Filed Apr. 29, 1991, Ser. No. 693,920

Int. Cl.[5] B22D *27/13*

U.S. Cl. 164—79 **19 Claims**

1. A process of forming a porous solid article comprising the steps of:

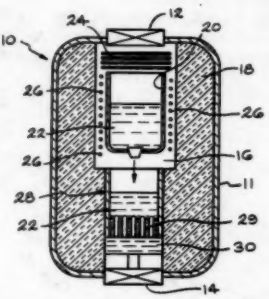
providing a base material;

heating said base material to cause said base material to melt to a liquid phase;

exposing said liquid phase of said base material to a gas which dissolves into said base material, said gas having a solubility in said base material which decreases with decreasing temperature of said base material and which increases with increasing pressure of said gas;

maintaining said gas at a predetermined pressure and allowing said gas to dissolve into said liquid phase of said base material;

cooling said base material causing said base material to solidify; and



controlling the pressure of said gas during said cooling step to cause said gas to precipitate within said solidifying base material thereby forming pores in said base material and thereby forming said porous solid article.

5,181,550

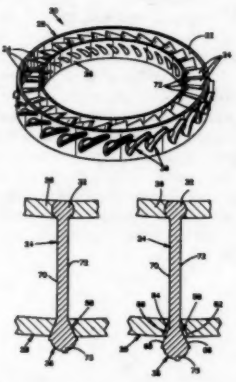
METHOD OF MAKING A TURBINE ENGINE COMPONENT

William S. Blazek, Valley City, and Harold L. Wheaton, Bowerston, both of Ohio, assignors to PCC Airfoils, Inc., Cleveland, Ohio

Filed Sep. 16, 1991, Ser. No. 760,873

Int. Cl.[5] B22D *19/04*

U.S. Cl. 164—100 **14 Claims**



1. A method of making a turbine engine component having a shroud ring with a plurality of airfoils disposed in an annular array, said method comprising the steps of providing a plurality of airfoils formed of a material having a first melting temperature, forming on at least one end portion of each of the airfoils a heat resistant layer which extends at least partially around the one end portion of each of the airfoils and has a second melting temperature which is greater than the first melting temperature, positioning the plurality of airfoils in an annular array, forming a mold having a shroud ring mold cavity in which the heat resistant layer on the one end portion of each of the airfoils is at least partially disposed, filling the shroud ring mold cavity with molten metal, engaging the heat resistant layer on the one end portion of each of the airfoils

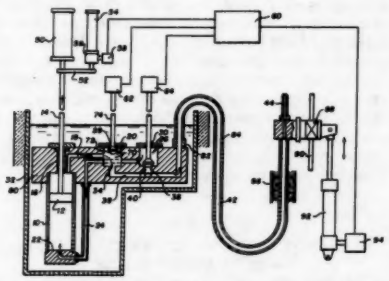
with the molten metal during performance of said step of filling the shroud ring mold cavity with molten metal, and solidifying the molten metal in the shroud ring mold cavity to form the shroud ring, said step of solidifying molten metal in the shroud ring mold cavity includes leaving joints between the one end portion of each of the airfoils and the solidified metal in the shroud ring mold cavity free of bonds to enable thermal expansion to occur between the airfoils and the shroud ring during use of the turbine engine component, wherein said step of forming a heat resistant layer includes forming a layer of chromium sesquioxide (Cr_2O_3) which extends at least partially around the one end portion of each of the airfoils .

5,181,551

DOUBLE ACTING CYLINDER FOR FILLING DIES WITH MOLTEN METAL

Thomas F. Kidd, Toledo, Ohio, and Stephen A. Thompson, St. Bruno, Canada, assignors to Electrovert Ltd., La Prairie, Canada

Filed Sep. 25, 1991, Ser. No. 766,551
Int. Cl.[5] B22D *17/04, 37/00*
U.S. Cl. 164—113 **26 Claims**



1. An apparatus for filling a die with molten metal comprising:

a tank adapted to contain molten metal;

a double acting cylinder having both ends closed and an injection piston therein;

means to reciprocate the piston in the cylinder;

first passage means from one end of the cylinder to a first valve having a first opening to the tank and a second opening to an injection passageway leading to a die;

the first valve having a first position wherein the first opening to the tank is open and the second opening to the injection passageway is closed, and a second position wherein the first opening to the tank is closed and the second opening to the injection passageway is open;

first valve operating means to transfer between the first position and the second position of the first valve;

second passage means from the other end of the cylinder to a second valve having a first opening to the tank and a second opening to the injection passageway;

the second valve having a first position wherein the first opening to the tank is open and the second opening to the injection passageway is closed, and a second position wherein the first opening to the tank is closed and the second opening to the injection passageway is open;

second valve operating means to transfer between the first position and the second position of the second valve, and

control means for the means to reciprocate the piston in the cylinder, and for the first valve operating means and the second valve operating means to fill the die with molten metal.

12. A method of producing a casting or encapsulation from molten metal or the like, including:

a double acting cylinder located within a tank containing molten metal, the cylinder having both ends closed and an injection piston therein, means to reciprocate the piston in the cylinder,

first passage means from one end of the cylinder to a first valve means with a first opening to the tank and a second opening to an injection passageway leading to a die,

second passage means from the other end of the cylinder to a second valve means with a first opening to the tank and a second opening to the injection passageway leading to the die,

the method comprising the steps of:

closing the first opening to the tank in the first valve means and opening the second opening from the first passage means to the injection passageway;

opening the first opening to the tank in the second valve means and closing the second opening from the second passage means to the injection passageway;

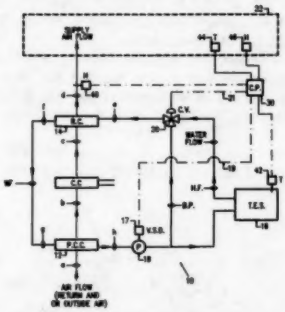
moving the piston towards the one end of the cylinder having the first passage means therein to draw molten metal into the cylinder through the second passage means and inject molten metal into the die through the first passage means and the injection passageway.

5,181,552

METHOD AND APPARATUS FOR LATENT HEAT EXTRACTION

Kenneth L. Elermann, 1049 Manchester Cir., Winter Park, Fla. 32792

Filed Nov. 12, 1991, Ser. No. 791,120
Int. Cl.[5] F24F *3/14;* **F25B** *29/00*
U.S. Cl. 165—21 **10 Claims**



1. A moisture control apparatus for use with a fluid compression air conditioning system having a compressor for compressing a compressible fluid, and a cooling coil where the compressible fluid decompresses absorbing thermal energy from a return air flow as a cooled supply air flow, the moisture control apparatus comprising:

a working fluid;

precooling coil means in said return air flow for exchanging thermal energy between the return air flow and the working fluid;

reheat coil means in said supply air flow for exchanging thermal energy between the working fluid and the supply air flow;

heat exchange means for exchanging thermal energy between the compressible fluid and the working fluid;

fluid pump means comprising a variable speed drive fluid pump for motivating a flow of the working fluid through said precooling coil means, said reheat coil means, and said heat exchange means;

fluid conduit means containing the working fluid therein for containedly directing the working fluid through a series arrangement of said precooling coil means, said heat exchange means, and said reheat coil means;

bypass conduit means, connected to said control valve in

parallel with said heat exchange means and in parallel with a series combination of said precooling coil means and said reheat coil means, for selectively circulating a first portion of the working fluid as a bypass flow through said series combination of said precooling coil means and said reheat coil means;

regulating means comprising a control valve connected to said fluid conduit means in said series arrangement, said control valve comprising a first input port connected to said fluid conduit means for receiving a first flow of said working fluid from said heat exchange means, a second input port connected to said bypass conduit means for receiving said bypass flow of said working fluid from said precooling coil means, an output port connected to said fluid conduit means for selectively exhausting said first and bypass flows from said control valve to said reheat coil means, and valving means for selectively metering said first and bypass flows through said control valve as a metered flow for regulating said working fluid flow through said precooling and reheat coil; and,

control means operatively associated with said control valve and said variable speed drive fluid pump for sensing moisture in said supply air flow and for maintaining said sensed moisture at a predetermined set point by regulating i) said valving means to selectively meter said first and bypass flows, and ii) said variable speed drive fluid pump to motivate the metered flow through said series precooling coil means.

5,181,553

AIR CONDITIONER SYSTEM FOR AUTOMOTIVE VEHICLE WITH MINIMUM DISCHARGE TEMPERATURE FOR REAR FOOT OUTLET

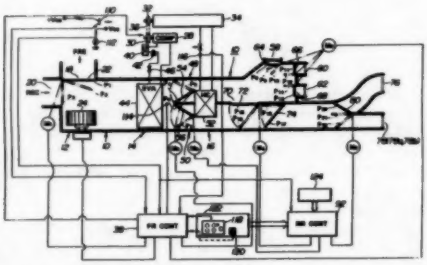
Koichi Doi, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 526,688, May 22, 1990, abandoned, which is a continuation of Ser. No. 363,304, Jun. 8, 1989, abandoned, which is a continuation of Ser. No. 190,120, May 5, 1988, abandoned. This application Feb. 20, 1991, Ser. No. 657,970

Claims priority, application Japan, Jun. 15, 1987, 62-148366

Int. Cl.[5] F25B *29/00*; B06H *3/00*; B61D *27/00*

U.S. Cl. 165—22 **11 Claims**



1. An air conditioning system for an automotive vehicle comprising:

air passage means defining an air path which branches into front and rear air paths, said front air path including front vent and front foot air outlets which open to a vehicular cabin near the front seat for discharging conditioned air into said vehicular cabin in the vicinity of the front seat, and said rear air path including rear vent and rear foot air outlets which open to said vehicular cabin in the vicinity of the back seat;

air conditioning means disposed within said air passage means, said air conditioning means including a cooling unit for cooling the air flowing through said air passage means and a heating unit for heating the air flowing through said air passage means, said cooling and heating units cooperatively generating conditioned air of a desired temperature, said air conditioning means including front and rear air-mix doors for changing front and rear path areas, through which air is introduced into said heating unit, each of said front and rear air-mix doors being movable between a fully open position at which the corresponding path area is maximum and a fully closed position at which the corresponding path area is minimum so that the temperature of the conditioned air passing through said front and rear paths increases as the opening angles of the front and rear air-mix doors increase;

a first detecting means for monitoring an actual opening angle of said rear air-mix door to produce a signal (X_{PBRRR}) representative of said actual opening angle of said rear air-mix door;

a second detecting means for monitoring an intake air temperature (T_{INT}) defined by the temperature of air flowing through an evaporating unit as measured just behind said evaporating unit, to produce an intake air temperature indicative signal;

inhibiting means associated with said air conditioning means, for comparing the signal value representative of said actual opening angle of said rear air-mix door with a target opening angle of said rear air-mix door, to correct the opening angle of said rear air-mix door, said target opening angle of said rear air-mix door being derived in such a manner as to be maintained at a value greater than a lower limit of said rear air-mix door opening-angle, whose lower limit is determined on the basis of said intake air temperature indicative signal value, such that a temperature of conditioned air discharged from said rear foot air outlet of said rear air path is maintained at a level greater than a predetermined temperature criterion (T_{30}).

5,181,554

RADIATOR COOLING APPARATUS FOR AN AUTOMOBILE ENGINE

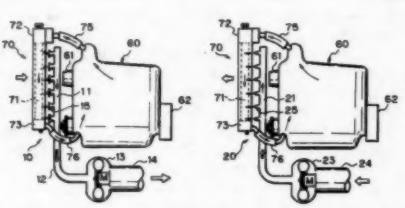
Yoshiyuki Mita, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Shizuoka, Japan

Filed Feb. 27, 1991, Ser. No. 661,535

Claims priority, application Japan, Feb. 28, 1990, 2-45642

Int. Cl.[5] F01P *7/10*

U.S. Cl. 165—41 **9 Claims**



1. A radiator cooling apparatus for an automobile engine, comprising:

a liquid cooled automobile engine;

a main radiator for cooling said automobile engine, having a core connected to said liquid cooled automobile engine by a first hose for delivery of hot liquid to said main radiator from said automobile engine and a second hose for return of liquid cooled by said main radiator to said automobile engine; and

an air flow duct for flowing air through said main radiator, said air flow duct comprising a hollow rectangular body defined by opposite rectangular surfaces, one of said surfaces having a plurality of air conduits extending outwardly therefrom parallel to each other toward said core of said main radiator, said one of said surfaces facing said core of said main radiator closely adjacent thereto, and a blower enclosed within an air passage tube connected to

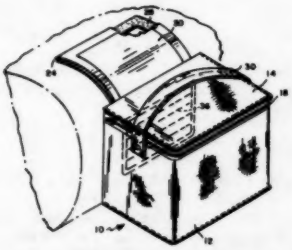
the interior of said hollow rectangular body for blowing air through said tube such that air flows through said plurality of air conduits and thus through said core of said main radiator, said hollow rectangular body being substantially the same size as said main radiator.

5,181,555

PORTABLE FOOD AND BEVERAGE STORAGE UNIT MOUNTED ADJACENT AN AIR VENTILATOR

Stephen A. Chruniak, 68 Longfellow Dr., Newburyport, Mass. 01950

Filed Aug. 8, 1991, Ser. No. 742,296
Int. Cl.[5] B60H *3/04*; A47K *1/08*
U.S. Cl. 165—41 **7 Claims**



1. A portable storage system for mounting adjacent an air ventilator of an air delivery system comprising;

a container formed from a pliable material;

(i) said container having a first displaceable cover located above a first opening in the top of said container providing access to the interior of said container in an open position and covering said first opening in a closed position,

(ii) said container having a second displaceable cover located beside a second opening in a sidewall of said container, said second opening being an air passageway leading air from said air ventilator into the interior of said container,

(iii) said second displaceable cover covering said second opening in a closed position and allowing an air flow through said air passageway in an open position,

(iv) said second displaceable cover provided with at least one first releasable fastener facing said container sidewall when said second displaceable cover is in a closed position,

(v) at least one second releasable fastener disposed on the exterior of the container, said at least one first releasable fastener cooperating with said at least one second releasable fastener to releasably seal said second displaceable cover to said container in said closed position thereof and,

(vi) at least one third releasable fastener mounted adjacent said air ventilator, said at least one first releasable fastener in said open position of said second displaceable cover cooperating with said at least one third releasable fastener to suspend the container adjacent to said air ventilator and to releasably fasten said container to said air ventilator so as to expose the air passageway to said air ventilator.

5,181,556

SYSTEM FOR SUBSTRATE COOLING IN AN EVACUATED ENVIRONMENT

John L. Hughes, Rodeo, Calif., assignor to Intevac, Inc., Santa Clara, Calif.

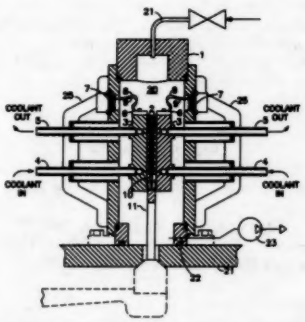
Filed Sep. 20, 1991, Ser. No. 763,355
Int. Cl.[5] F23F *23/00*
U.S. Cl. 165—80.1 **8 Claims**

1. An apparatus for cooling an article having opposite substantially planar outer surfaces in an evacuated environment, comprising:

a heat exchanging structure, said structure having a pair of stationary heat sinks having substantially planar parallel facing surfaces disposed within a vacuum chamber;

transfer means for moving the article into and out of a position with its respective outer surfaces adjacent to and substantially parallel with said facing surfaces of said heat sinks;

said heat sinks being spaced a predetermined distance apart sufficient to permit the insertion and removal of said article therebetween without contact with said heat sinks;



said predetermined distance being further selected to permit a substantial convective/conductive heat transfer from said article to said heat sinks; and

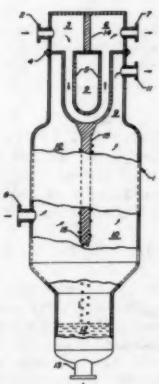
means for providing a high conductivity gas flow between said heat sinks and said article at a pressure significantly above that of said vacuum chamber, yet substantially below that of the atmosphere.

5,181,557

APPARATUS FOR SEPARATING A RESIN PHASE FROM A SOLVENT SOLUTION CONTAINING A SOLVENT, DEMETALLIZED OIL AND A RESIN

Brian W. Hedrick, Rolling Meadows, Ill., assignor to Uop, Des Plaines, Ill.

Division of Ser. No. 653,918, Feb. 12, 1991, Pat. No. 5,145,574.
This application May 21, 1992, Ser. No. 886,207
Int. Cl.[5] C10G *21/28*; B01D *11/04*
U.S. Cl. 165—113 **6 Claims**



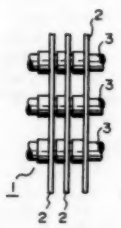
1. A heat-exchange apparatus for separating a resin phase from a solvent solution containing a solvent, demetallized oil and resin which comprises:

(a) at least one generally vertically positioned heat-exchange surface having an upper portion and a lower portion;
(b) an inlet for directing the flow of said solvent solution over a portion of said heat-exchange surface;
(c) a means for heating said upper portion of said vertically positioned heat-exchange surface with a circulating hot heat-exchange fluid thereby heating said solvent solution to precipitate a resin phase;
(d) a means for heating said lower portion of said vertically positioned heat-exchange surface by conduction of heat from said upper portion of said vertically positioned heat-exchange surface;
(e) an outlet means for recovering a solvent solution having a reduced concentration of resin; and
(f) an outlet means for recovering a resin phase from a lower portion of said heat-exchange apparatus.

5,181,558
HEAT EXCHANGER

Yoshiyuki Tsuda, Toyonaka, and Akiko Iwamoto, Osaka, both of Japan, assignors to Matsushita Refrigeration Company, Osaka, Japan

Filed Oct. 23, 1991, Ser. No. 779,199
Claims priority, application Japan, Nov. 13, 1990, 2-307471; Jun. 11, 1991, 3-138783; Jun. 11, 1991, 3-138784
Int. Cl.[5] F28F *19/02*
U.S. Cl. 165—133 **5 Claims**



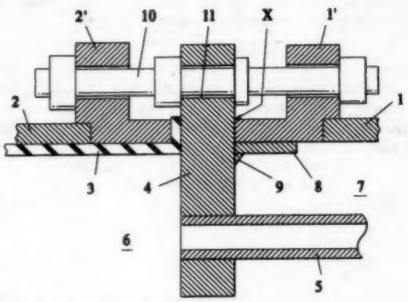
1. A heat exchanger, comprising:
a plurality of plate-shaped fins disposed in parallel with a predetermined spacing which allows flow therebetween; and
heat transfer tubes extending across plate-shaped fins at right angles,
wherein a composition comprising a solution containing a silicone resin compound and inorganic finely divided particles having a ratio of 10 to 40 wt % to the solids content in said solution, a large area/weight ratio and a small average particle diameter is coated to said plate-shaped fins.

5,181,559
WATER-COOLED CONDENSER

Vaclav Svoboda, Baden, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Nov. 26, 1991, Ser. No. 797,899
Claims priority, application European Pat. Off., Dec. 5, 1990, 90123310.6
Int. Cl.[5] F28F *19/02*
U.S. Cl. 165—134.1 **1 Claim**

1. A condenser comprising titanium tubes attached to titanium tube plates at either end of the tubes, with a steel condenser casing surrounding the tubes and disposed between the tube plates, and header casings at either end of the condenser on the sides of the tube plates opposite the condenser casing, said condenser and header casings being provided with respective flanges by which they are bolted to the tube plates, the flanges of the condenser casing being provided with explosion-bonded titanium plating at a location adjacent to the tube plates, the titanium plating being welded in a watertight manner to the tube plates on the condenser casing side, wherein the bolting arrangement by which the casings and tube plates are

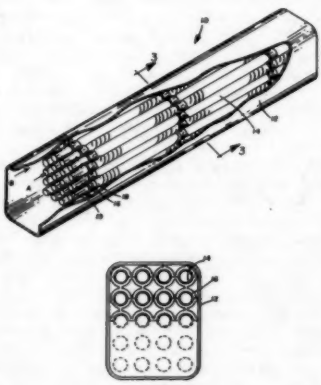


attached is located outside the surfaces where the respective flanges of the condenser and header casings are joined to the tube plates.

5,181,560
BAFFLELESS TUBE AND SHELL HEAT EXCHANGER HAVING FLUTED TUBES

Mark N. Burn, 1221 Tyler St., Port Townsend, Wash. 92368

Filed Oct. 17, 1990, Ser. No. 599,154
Int. Cl.[5] F28F *9/00*
U.S. Cl. 165—162 **21 Claims**



1. A baffleless tube and shell heat exchanger for cooling a medium, comprising:
a shell having an inlet and an outlet;
a plurality of tubes longitudinally disposed on said shell, each of said tubes having an inlet and an outlet for passing one of a coolant and said medium therethrough, the other of said coolant and said medium passing through said shell along the exterior of said tubes, the interior and exterior circumference of said tubes being fluted substantially along the entire length thereof to define spiralled cavities at the periphery of a generally circular tube structure such that said one of said coolant and said medium flows substantially longitudinally through said tubes in a spiralled manner to force centripetally outwardly said one of said coolant and said medium into said spiralled cavities, said other of said coolant and said medium passes substantially longitudinally through said shell in a spiralled manner; and
means for supporting said tubes intermittently positioned inside said shell between a first end and a second end of

said shell wherein the flow of said other of said coolant and said medium through said heat exchanger only experiences restriction due to said tubeless and said support means, there being no baffles to restrict said flow, said means for supporting said tubes maintaining said tubes separate from one another so that there is no substantial contact between the tubes for support purposes said support means comprising a tube support structure having holes for receiving said tubes, and openings disposed between said holes permitting substantially unobstructed flow of said other of said coolant and said medium therethrough.

5,181,561

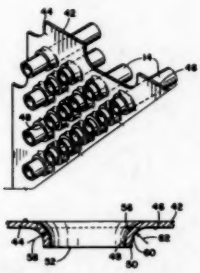
STIFFENER FOR USE WITH A HEAT EXCHANGER

Richard C. Ayers, Collinsville, and Thomas G. Wilson, Owasso, both of Okla., assignors to Lansing Overhaul And Repair, Inc., Tulsa, Okla.

Filed Nov. 7, 1991, Ser. No. 788,856

Int. Cl.[5] F28F *9/00*

U.S. Cl. 165—162 **4 Claims**



1. For use in a heat exchanger having a plurality of tubes, a stiffener plate for supporting the tubes comprising:

a unitary relatively thin planar metal plate of selected thickness, the plate having an opening therethrough for each tube to be supported, each opening being in the form of an integral ferrule portion of internal diameter dimensioned to receive a tube therethrough, each integral ferrule portion having an integral arcuate portion and an integral short length tubular portion terminating in an end surface in a plane paralleled to and spaced from said plate said integral arcuate portion and said integral tubular portion of each said integral ferrule portion being of substantially the same thickness as said plate.

5,181,562

HEAT EXCHANGER ELEMENT AND METHOD OF MAKING THE SAME

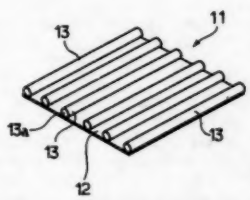
Hideaki Kuriki, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 12, 1992, Ser. No. 849,957

Claims priority, application Japan, Mar. 15, 1991, 3-76937

Int. Cl.[5] F28F *3/08*

U.S. Cl. 165—166 **2 Claims**



1. A heat exchange element comprising a heat exchanging sheet member containing heat meltable synthetic resin fibers and a plurality of elongate rollable shaped spacers, the heat exchanging sheet member having one side on which the spacers are bonded by a heat meltable layer of the synthetic resin fibers contained in the heat exchanging sheet member so that each spacer is spaced from the adjacent spacer on the heat exchanging sheet member.

5,181,563

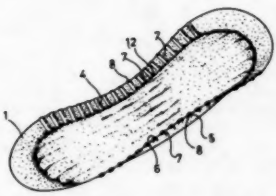
ANATOMICALLY SHAPED ABSORBENT PAD

Everson Amaral, Sao Paulo, Brazil, assignor to McNeil-PPC, Inc., Milltown, N.J.

Continuation of Ser. No. 336,623, Apr. 7, 1989, abandoned, which is a continuation of Ser. No. 26,362, Mar. 16, 1987, abandoned. This application Dec. 14, 1989, Ser. No. 453,215

Int. Cl.[5] A61F *13/15*

U.S. Cl. 604—385.2 **6 Claims**



1. An elongated anatomic absorbent comprising an absorbent substrate having longitudinal edges along the length of the substrate and transverse ends, sandwiched between a fluid impermeable layer designed to be remote from the body of the user and a fluid permeable layer for surface contact in the perineal area of the user, said layers being bonded to each other at least at the ends of the absorbent, and the longitudinal edges of the absorbent having elastic means which provide it with an anatomic curved profile along the perineal area of the user, wherein said elastic means comprises a strip of heat-shrinkable material in the contracted state, so that the longitudinal edges of the absorbent are raised with relation to the horizontal, said layers being intermittently bonded to the elastic means at a plurality of regions interspaced along the lengths of the elastic means, the bond between the layers not being continuous in those parts of the side flaps which are provided with the elastic means such that the discontinuous bonds in the parts of the side flaps which are provided with the elastic means permit body fluid which would otherwise overflow the longitudinal edges and cause absorbent failure to flow directly to the absorbent substrate without substantial leakage.

5,181,564

MILLING TOOL

John D. Lindley; Colin R. Mackenzie, both of Aberdeen, and Mark E. Hall, Kintore, all of United Kingdom, assignors to Weatherford-Petco, Inc., Houston, Tex.

Filed Oct. 8, 1991, Ser. No. 774,048

Claims priority, application United Kingdom, Oct. 10, 1990, 9022062

Int. Cl.[5] E21B *10/26*

U.S. Cl. 166—55.6 **14 Claims**

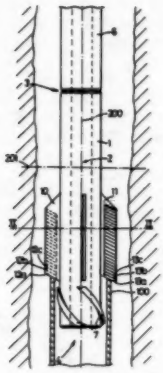
1. A tool for milling a down-hole casing or tubing comprising a tubular body rotatable about its longitudinal axis and having a longitudinal passage therethrough;

means at a first end of the cylindrical body for connection to a drive means to rotate the body, said first end to form the upper end of the body in the working position;

at least one first blade extending outwardly from the cylindrical body and having a lowermost cutting edge extending upwardly from its innermost portion at an angle of

from about 2° to about 60° to a radial plane perpendicular to said longitudinal axis;

at least one second blade extending outwardly from the



cylindrical body and having a lowermost cutting edge extending downwardly from its innermost portion at an angle of from about 2° to about 60° to a radial plane perpendicular to said longitudinal axis.

5,181,565

WELL PROBE ABLE TO BE UNCOUPLED FROM A RIGID COUPLING CONNECTING IT TO THE SURFACE

Jean Czernichow, Malabry, France, assignor to Institut Francais du Petrole, Total Compagnie Francaise des Petroles, Compagnie Generald de Geophysique, Service National Dit: Gaz de France, Societe Nationale Elf Aquitaine (Production), Paris, France

Filed Dec. 20, 1990, Ser. No. 631,253

Claims priority, application France, Dec. 20, 1989, 89 17029

Int. Cl.[5] E21B *49/00*

U.S. Cl. 166—66 **13 Claims**

1. A well probe adapted to be mechanical uncoupled from a rigid linking member connecting the well probe to a surface installation, the well probe comprising:

at least two offset shoes fixed around the rigid linking member at a distance from each other;

a mobile harness including at least one intermediate shoe disposed around the rigid linking member between the offset shoes, said intermediate shoe including a central passage having a cross-section larger than a cross-section of the rigid linking member, and at least one measuring casing associated with the intermediate shoe;

means for laterally retractably displacing said measuring casing with respect to said intermediate shoe and said rigid linking member to couple and uncouple the measuring casing with a portion of a well; and

conductive means for connecting the measuring casing to a recording unit,

wherein said two offset shoes are arranged in such a manner so that, in an anchoring position in the well, the rigid linking member is centered in said central passage of the intermediate shoe so as to suppress any direct contact between the intermediate shoe and the rigid linking member.

5,181,566

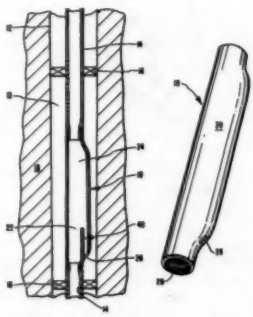
SIDEPOCKET MANDREL APPARATUS AND METHODS

Michael R. Barneck, Rte. 1, Box 1538, Roosevelt, Utah 84066

Filed May 10, 1991, Ser. No. 698,713

Int. Cl.[5] E21B *23/03*

U.S. Cl. 166—117.5 **21 Claims**



1. A sidepocket mandrel apparatus, comprising:

a mandrel body formed of a resin-based material, the mandrel body defining a through-bore and an enlargement axially offset from the through-bore; and

a valve receiving pocket formed of a rigid material and secured within the offset enlargement of the mandrel body so as to be substantially parallel to but axially offset from said through-bore.

5,181,567

METHOD FOR PROLONGING THE USEFUL LIFE OF POLYMERIC OR BLENDED SCALE INHIBITORS INJECTED WITHIN A FORMATION

Patrick J. Shuler, Yorba Linda, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.

Continuation of Ser. No. 729,744, Jul. 2, 1991, abandoned, which is a continuation-in-part of Ser. No. 528,636, May 23, 1990, Pat. No. 5,038,861. This application May 18, 1992, Ser. No. 887,569

Int. Cl.[5] E21B *43/12*

U.S. Cl. 166—279 **14 Claims**

1. A method for prolonging useful life of scale inhibitors injected within a formation comprising:

a. injecting an aqueous solution of said scale inhibitors into said formation, wherein said solution of scale inhibitors comprises a polymeric scale inhibitor; and

b. injecting an aqueous solution of polyquaternary amines into said formation.

5,181,568

METHODS OF SELECTIVELY REDUCING THE WATER PERMEABILITIES OF SUBTERRANEAN FORMATIONS

Kenneth W. McKown, and Danny Rothenberger, both of Hays, Kans., assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 26, 1991, Ser. No. 766,604
Int. Cl.[5] E21B *33/138*
U.S. Cl. 166—293 16 Claims

1. A method of selectively reducing the water permeability of a subterranean formation containing oil and salt water zones said method comprising the steps of:

introducing into said oil zone a viscous aqueous polymer composition which will subsequently form a crosslinked gel;

thereafter introducing into said oil zone a hydrocarbon cement slurry to displace at least a portion of said polymer composition from said oil zone to said salt water zone, said hydrocarbon cement slurry, when in contact with water in said salt water zone, hydrates and sets into a substantially impermeable mass; and

allowing said aqueous polymer composition to crosslink and said cement to set;

wherein said aqueous polymer composition comprises water, at least one crosslinkable polymer and a delayed crosslinking agent and

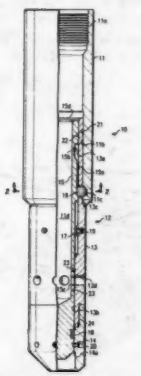
wherein said hydrocarbon cement slurry is comprised of a hydrocarbon liquid, a particulate hydraulic cement having a particle size not greater than about 30 microns and a surfactant for facilitating the dispersal of said cement in said hydrocarbon liquid.

5,181,569

PRESSURE OPERATED VALVE

Brian K. McCoy, Dubai, United Arab Emirates, and Tommy L. Stambaugh, Celina, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Mar. 23, 1992, Ser. No. 856,185
Int. Cl.[5] E21B *34/14*
U.S. Cl. 166—317 7 Claims



1. A pressure operated valve comprising:

(a) a cylindrical housing;

(b) sleeve valve means for controlling flow between outside and inside said housing; said sleeve valve means releasably connected in said housing, said sleeve valve means including a valve sleeve having a sealing surface therein, said valve sleeve moveable downwardly from an open position, permitting flow between the outside and inside said housing to closed position, preventing flow between outside and inside said housing, said valve sleeve further moveable to a released position disconnecting said sleeve valve means from said housing;

(c) means for releasably connecting said sleeve valve means in said housing; and

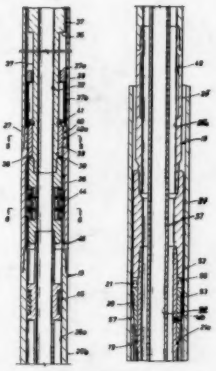
(d) a ball for sealingly engaging said valve sleeve sealing surface and moving said sleeve from said open to closed to released position and expending said sleeve valve means from said housing.

5,181,570

LINER HANGER ASSEMBLY

Roger P. Allwin, Bryan, Tex., and James W. Agnew, Oklahoma City, Okla., assignors to MWL Tool Company, Houston, Tex.

Filed May 10, 1984, Ser. No. 609,104
Int. Cl.[5] E21B *19/00*
U.S. Cl. 166—381 24 Claims



1. A method for setting a linear casing in a well bore and cementing comprising the steps of:

lowering a linear hanger in a well bore on a setting tool attached to a string of tubing to a desired location where the linear hanger has slip means releasably attached to a liner hanger mandrel and the slip means are movable from an unset position to a set position and where the linear hanger mandrel is attached to the liner casing and where the setting tool is releasably attached to the liner hanger mandrel,

at the desired location in a well bore and prior to moving the slip means to a set position, rotating the liner hanger mandrel and liner casing and the string of tubing and determining the torque required at the earth's surface for rotating the liner casing in the well bore before the slip means are moved to a set position,

releasing the slip means and moving the liner hanger-mandrel and slip means to s set position of the slip means where the slip means engage the well bore,

obtaining a surface indication that the slip means are in a set position by applying a downward force to the string of tubing for operating a release mechanism in the setting tool and producing an observable longitudinal motion of the string of tubing at the earth's surface,

rotating the liner hanger mandrel and the string of tubing while the slip means are in a set position and determining at the earth's surface, the torque required for rotating the casing liner with the slip means in a set position,

maintaining the continuity of the bore of string of tubing, the setting tool and the liner hanger mandrel while rotating the setting tool, the liner hanger mandrel and the string of tubing and while passing cement through the bore of the string of tubing, the setting tool, and the liner hanger mandrel to introduce cement to the liner casing in a well bore while the liner casing is being rotated for cementing the liner casing in a wellbore.

5,181,571

WELL CASING FLOTATION DEVICE AND METHOD

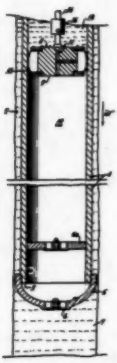
Mark D. Mueller, Santa Maria, Calif.; Frank L. Jones, Balikpapan, Indonesia; Julio M. Quintana, Bakersfield, Calif.; Kenneth E. Ruddy, Houston, Tex., and Michael G. Mims, Bakersfield, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 569,691, Aug. 22, 1990, which is a continuation-in-part of Ser. No. 401,086, Aug. 31, 1989, Pat. No. 4,986,361, and a continuation-in-part of Ser. No. 486,312, Feb. 28, 1990, abandoned, and a continuation-in-part of Ser. No. 560,389, Jul. 31, 1990, which is a continuation-in-part of Ser. No. 401,086, , and Ser. No. 486,312,. This application Feb. 10, 1992, Ser. No. 820,997

The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.

Int. Cl.[5] E21B *33/10*

U.S. Cl. 166—381 24 Claims



1. A process useful in installing a duct segment within an underground hole which contains a first fluid and extends underground from at least a near surface position to at least a shallow underground position, said process comprising:

inserting said duct into said hole, said duct having a flotation chamber containing a second fluid having a density less than said first fluid sufficient to produce a buoyant force on said duct when said duct is immersed in said first fluid, said flotation chamber further comprising:

a fluid restriction device attached to said duct at a downhole end of said flotation chamber;

a fluid trapping insert attached to said duct at an uphole end of said flotation chamber; and

wherein said shallow underground position is displaced a vertical distance and a substantial horizontal distance from said near surface position, said horizontal distance being greater than said vertical distance.

5,181,572

FARM IMPLEMENT ROW GUIDANCE DEVICE

Eugene C. Andersen, R.R. 2, Sheldon, Mo. 64784, and Gary W. Balk, Rt. 3, Nevada, Mo. 64772

Filed Dec. 23, 1991, Ser. No. 811,953

Int. Cl.[5] A01B *69/06*

U.S. Cl. 172—6 8 Claims

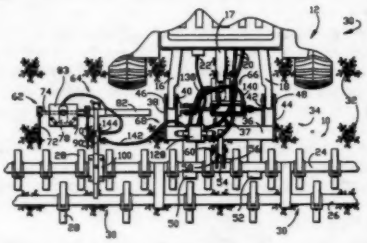
1. Apparatus for adjusting the position of a field implement assembly including a ground-working implement operably coupled to laterally spaced apart swayable hitch arms, the ends of said arms remote from said implement being swayably connected to a tractor for pulling the assembly along generally parallel field rows, said tractor including a draw bar separate from and between said arms, said apparatus comprising:

means for sensing the position of said ground-working implement relative to said rows as said assembly is pulled therealong;

means for operably coupling said sensing means to said ground-working implement; and

adjusting structure operatively connected with said sensing means and responsive to said sensing means for adjusting the position of said field implement assembly,

said adjusting structure comprising a selectively actuatable piston and cylinder assembly including a cylinder and a shiftable piston rod extending from one end of said cylinder, bracket means operably coupled to said draw bar and



including an upright segment extending above the draw bar, first ball joint means supported on said upright segment and located above said draw bar for coupling one of said cylinder and piston rod to said upright segment between said swayable arms, and second ball joint means mounting the other of said cylinder and piston rod to said field implement assembly, said piston and cylinder assembly being operable upon actuation thereof in response to said sensing means for lateral movement of said field implement assembly to effect adjustment of said ground-working implement.

5,181,573

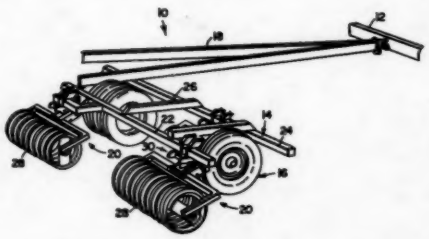
SEED BED PACKER IMPLEMENT

Peter D. Almen, Devils Lake, N. Dak., assignor to Summers Manufacturing Company, Inc., N. Dak.

Filed Jun. 18, 1991, Ser. No. 717,032

Int. Cl.[5] A01B *29/04*

U.S. Cl. 172—459 1 Claim



1. An agricultural implement adapted for connection to a towing vehicle for forward movement over soil, said implement comprising:

a frame with a plurality of wheels operably connected thereto, said frame including a tow bar adapted for connection to said towing vehicle, said frame also including a tool bar, said wheels supporting weight of said implement;

a plurality of packer tools and a plurality of means for connecting each of said packer tools to said tool bar, each of said connecting means including a lever arm and a swivel base through which said lever arm is connected to said tool bar, said swivel base allowing said packing means to

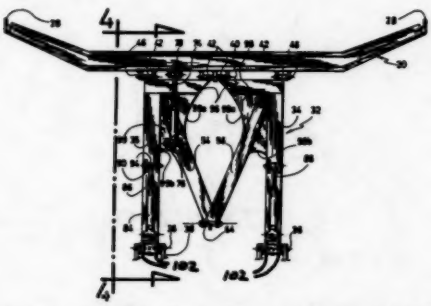
tilt transversely and to adjust elevationally with respect to said tool bar, said connecting means further including a spring biased to force said packer tool toward the soil, said spring being attached at a first end of said lever arm on one side of said tool bar, said packer being attached at a second end of said lever arm on a side opposite said one side of said tool bar.

5,181,574

SCRAPER BLADE MOUNT FOR BULLDOZER

Fernand Dion, 195, route 138, Saint-Augustin, Canada G3A 1W3

Filed Dec. 4, 1991, Ser. No. 802,213
Int. Cl.[5] E02F 3/76
U.S. Cl. 172—816 5 Claims



5. A coupling device for loading a ground scraping blade frontwardly of a bulldozer, said bulldozer of the type having a chassis rollingly supported over ground and carrying an opeator's cockpit, said blade of the type having a planar main body destined to stand generally transversely to the ground in the operative position of the scraping blade and defining one and another opposite lateral side end portions, said coupling device comprising:

(a) first means for supporting said blade onto a front portion of said chassis;

(b) second means for relative movement of said blade about said chassis;

(c) third means for power lifting said one of said lateral side end portions of said blade exclusively of said another lateral side end portion thereof, said third means being of a non blade varying type; and

(d) remote control means, for operating said third power means remotely by said operator in said cockpit;

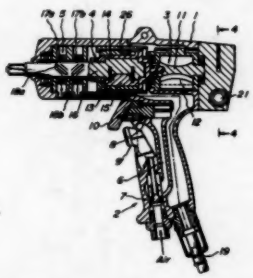
wherein said first means consists of a planar support member defining front and rear ends, said support member front end endwisely mounted to said blade; said second means consisting of connector means, for pivotally interconnecting said support member front end of said blade, and a first pivot member, mounted to said support member rear end and destined to pivotally engage a front portion of said bulldozer chassis; said third means consisting of a pair of elongated, first and second bars, each said bar defining a front and a rear end, said bars front ends being anchored to said support member front end in laterally spaced apart fashion, said bars rear ends being positioned in transverse alignment with one another whereby said bars converge at their rear ends, said first bar rear end being located generally above said second bar rear end; and further including power ram means, pivotally interconnecting said bars rear ends for relative displacement of said second bar rear end away from or toward said first bar rear end along a line generally transverse to a plane intersecting said planar support member; wherein extension of said ram means to displace said second bar rear end away from said first bar rear end inducing lift of the blade lateral side end portion on the side of said first bar front end exclusively of the blade opposite lateral side end portion.

5,181,575

IMPACT WRENCH HAVING TORQUE CONTROLLING FACULTY

Junichi Maruyama; Teruo Fukumura, both of Yokohama, and Sadatsugu Kawaguchi, Osaka, all of Japan, assignors to Nissan Morot Co., Ltd., Yokohama and Uryu Siesaku, Ltd., Osaka, both of, Japan

Filed Mar. 9, 1992, Ser. No. 848,144
Claims priority, application Japan, Mar. 7, 1991, 312370[U]
Int. Cl.[5] B25B 23/14
U.S. Cl. 173—180 9 Claims



1. An impact wrench with the torque controlling faculty comprising:

a main housing;

a main spindle arranged rotatably and made of material having a magnetic strictive effect;

an air motor unit including an eccentric cylinder, a rotary driving shaft arranged rotatably within said eccentric cylinder and vanes secured to said rotary driving shaft;

an air supply unit including an air conduit for supplying a compressed air to said eccentric cylinder of the air motor unit to rotate said rotary driving shaft;

a shut-off valve provided in said air supply unit for selectively cutting a supply of the compressed air to said eccentric cylinder of the air motor unit;

an oil pressure pulse generating unit provided between said main spindle and said rotary driving shaft of the air motor unit for converting a primary torque of the rotary driving shaft into a pulsatory secondary torque which is applied to said main spindle and has a first frequency;

a transducing means including a magneto-electric converting means for detecting a change in a permeability of a surface portion of the main spindle, an exciting current generating means for generating an exiting current which is supplied to said magneto-electric converting means and has a predetermined second frequency which is higher than said first frequency, and a detecting means connected to said magneto-electric converting means for detecting a change of said exciting current to produce a torque detection signal which represents a pulsatory change of a torque applied to said main spindle;

a signal processing circuit connected to said detecting means for sampling and holding said torque detection signal at a predetermined constant phase to generate a torque measurement signal;

a control circuit for receiving said torque measurement signal to produce a valve cut command when the torque measurement signal exceeds a predetermined threshold value;

a pilot valve connected to said shut-off valve and having an electromagnet for driving the pilot valve; and

a signal transmitting means for supplying said valve cut command to said electromagnet of the pilot valve to close said shut-off valve.

5,181,576

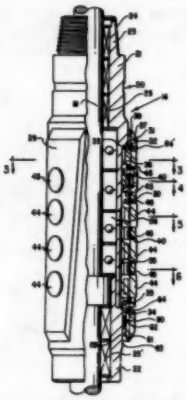
DOWNHOLE ADJUSTABLE STABILIZER

Warren E. Askew, and Alan Eddison, both of Houston, Tex., assignors to Anadrill, Inc., Sugar Land, Tex.

Continuation-in-part of Ser. No. 649,777, Feb. 1, 1991, abandoned. This application Jul. 30, 1991, Ser. No. 737,637

Int. Cl.[5] E21B *7/04*

U.S. Cl. 175—61 **40 Claims**



1. A downhole adjustable stabilizer apparatus comprising: a mandrel, sleeve means mounted on said mandrel for limited relative rotation; a plurality of radially movable members on said sleeve means, said members being movable between retracted and extended positions; and means responsive to rotation of said sleeve means relative to said mandrel in one rotational direction for enabling retraction of at least some of said members, and in the other rotational direction for causing extension of at least some of said members, said members when retracted enabling said apparatus to be tilted in a borehole.

5,181,577

DEVICE FOR FIXING DISK CUTTER TO TUNNEL EXCAVATOR

Toshio Tsukamoto, and Yoshihito Minami, both of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

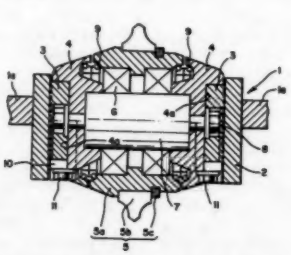
PCT No. PCT/JP90/01199, § 371 Date Mar. 17, 1992, § 102(e) Date Mar. 17, 1992, PCT Pub. No. WO91/04393, PCT Pub. Date Apr. 4, 1991

PCT Filed Sep. 19, 1990, Ser. No. 838,787

Claims priority, application Japan, Sep. 25, 1989, 1-110926[U]

Int. Cl.[5] E21B *10/10*

U.S. Cl. 175—261 **1 Claim**



1. A device for fixing a disk cutter to a shield excavator comprising a plurality of cylindrical cases provided on a face plate of a cutter head which is rotatably disposed on the front part of a shield proper, bosses disposed to project face-to-face in each of these cases, retainers having U-shaped grooves therein and provided at both ends of a shaft rotatably supporting a cutter proper, the U-shaped grooves being fitted onto the bosses, a key block fixed to the open sides of the U-shaped grooves which are formed on the retainers wherein the cutter proper can be fixed to the case with the bosses clamped by the key block and the retainers.

5,181,578

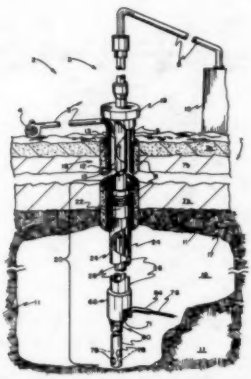
WELLBORE MINERAL JETTING TOOL

O. Wayne Lawler, 8022 Twelfth Fairway, Humble, Tex. 77346

Filed Nov. 8, 1991, Ser. No. 790,217

Int. Cl.[5] E21B *10/00*

U.S. Cl. 175—424 **13 Claims**



1. A wellbore jetting tool mining comminuting and collecting tool for use with, and installed at the lower end of, a drilling pipestring having a longitudinal axis, the pipestring being inserted into a predrilled and cased vertical hole, said comminuting and collecting tool comprising an inner and an outer tube wherein pressurized fluid flows from a source above ground through the pipestring into one of said inner and outer tubes, and a slurry created by discharge of said pressurized fluid is collected and conducted above ground in the other of said inner and outer tubes,

said comminuting and collecting tool further comprising a cutting jet nozzle means extensible from said comminuting and collecting tool at an angle whereby a jet of pressurized fluid discharged axially from said jet nozzle means is directed against surrounding mineral deposits at said angle from said vertical hole, and

pressure from said jet lifts said slurry and also supports a roof of a chamber defined in a geological formation by hydraulic comminution and collection, and

said tool assumes dimensions sufficiently small to fit into the cased hole by retraction of said jet nozzle upon cessation of flow of pressurized fluid.

5,181,579

STEERING AND DRIVING SYSTEM

Donald L. Gilliem, W. Lafayette, Ind., assignor to TRW Inc., Lyndhurst, Ohio

Filed Apr. 17, 1991, Ser. No. 686,672

Int. Cl.[5] B62D *11/00*

U.S. Cl. 180—6.48 **16 Claims**

1. A steering and driving system for a vehicle having a first wheel on a first side of the vehicle and a second wheel on a second side of the vehicle, said system comprising:

a first reversible hydraulic motor means for driving the first wheel of the vehicle;

a second reversible hydraulic motor means for driving the second wheel of the vehicle;

first valve means for controlling the direction and speed of operation of said first reversible hydraulic motor means;

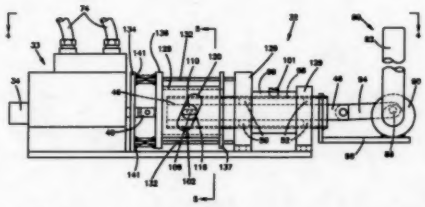
second valve means for controlling the direction and speed of operation of said second reversible hydraulic motor means;

an actuator shaft;

force transmitting means for moving said actuator shaft along its axis and for rotating said actuator shaft about its axis; and

connector means for connecting said actuator shaft with said first and second valve means;

said connector means being operable by said actuator shaft to actuate said first and second valve means to vary the operating speed of said first and second reversible hydraulic motor means upon movement of said actuator shaft along its axis during operation of said first and second reversible hydraulic motor means in forward and reverse directions;



said connector means being operable by said actuator shaft to actuate said first and second valve means to increase the operating speed of said first reversible hydraulic motor means and decrease the operating speed of said second reversible hydraulic motor means upon rotation of said actuator shaft in a first direction about its axis and to actuate said first and second valve means to decrease the operating speed of said first reversible hydraulic motor means and to increase the operating speed of said second reversible hydraulic motor means upon rotation of said actuator shaft in a second direction about its axis.

5,181,580

CYCLICAL VARIABLE APERTURE VALVE FOR AIR CUSHION VEHICLES

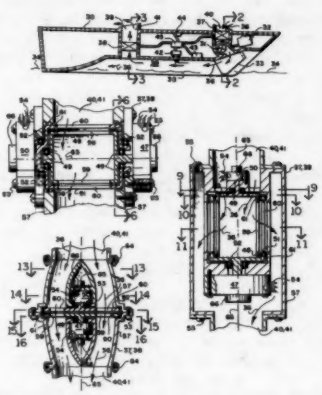
Donald E. Burg, 15840 SW. 84 Ave., Miami, Fla. 33157

Filed Feb. 6, 1990, Ser. No. 475,708

Int. Cl.[5] B60V *1/00;* **F16K** *3/04, 3/08*

U.S. Cl. 180—116 **61 Claims**

1. A fluid control means to reduce water wave generated pressure pulses in a pressurized supporting gas cushion of an air cushion marine vehicle, said pressurized supporting gas cushion supplied with pressurized gas by a gas pressurizing means, comprising: a rotary valve element positioned downstream of the pressurized supporting gas cushion of the air cushion marine vehicle, rotation of the rotary valve element to successively align and misalign openings in said rotary valve element with other openings in said fluid control means resulting in at least partial opening and closing of a passageway that vents the water wave generated pressure pulses from the pressurized support gas cushion, said opening and closing of the passageway controlled by a controller such that opening occurs, during the water wave generated pressure pulses and closing occurs between the water wave generated pressure pulses thereby providing a reduction in the water wave generated



pressure pulses and a smoother ride in the air cushion marine vehicle.

5,181,581

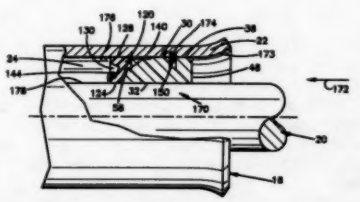
RACK BUSHING WITH INTEGRAL SEAL

Leonard W. Engler, Rochester Hills, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Feb. 8, 1991, Ser. No. 652,584

Int. Cl.[5] B62D *5/22*

U.S. Cl. 180—148 **1 Claim**



1. A method of assembling a power steering apparatus comprising the steps of:

providing a tubular housing partially defining a chamber for receiving fluid under pressure and having a first snap ring groove therein and a tapered end portion;

providing a rack extending axially through the chamber in the tubular housing;

providing an annular bushing for supporting the rack for axial movement in the chamber, the bushing having a cylindrical outer surface with a second snap ring groove therein, a cylindrical inner surface spaced radially inward from the outer surface and defining a passage extending longitudinally through the bushing for receiving the rack therethrough, and an annular radially extending end face between the inner and outer surfaces, the bushing end face having a retaining ridge and a groove;

providing an annular one-piece resilient seal member, the seal member having an annular outer seal surface for sealingly engaging the tubular housing and an annular inner seal surface for sealingly engaging the rack, the inner seal surface being spaced radially inward from the outer seal surface and defining a passage extending longitudinally through the seal for receiving the rack therethrough, the seal member having an annular radially extending end face between the inner and outer seal surface

for engaging the end face of the bushing, the seal member having a resilient lip portion;

detachably connecting the seal member with the bushing by stretching the lip portion of the seal member radially outwardly, passing the lip portion of the seal member over the retaining ridge of the bushing and allowing the lip portion of the seal member to drop into the groove in the bushing;

placing the snap ring in the second snap ring groove in the bushing;

inserting the assembled bushing, seal member and snap ring axially into the tapered end portion of the tubular housing to compress the snap ring radially inwardly; and

moving the assembled bushing, seal member and snap ring axially in the tubular housing until the snap ring snaps radially outwardly into engagement in the first snap ring groove in the tubular housing.

5,181,582

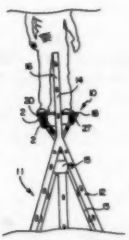
SCAFFOLD FOR AN A-FRAME LADDER

Merman R. Meadows, Rt. 10, Box 137, Mooresville, N.C. 28115

Filed Nov. 19, 1991, Ser. No. 794,507

Int. Cl.[5] E06C *7/16*

U.S. Cl. 182—121 **8 Claims**



1. A scaffold for an A-frame ladder, comprising:

(a) a platform for being positioned between two legs of the ladder, supported on a bottom side of the platform intermediate two opposing ends thereof by a rung of the ladder and extending outwardly from opposite sides of the ladder;

(b) a first strut pivotally attached to the bottom side of the platform adjacent one end thereof and extending diagonally downward for engagement with a rung of the ladder below the rung supporting the bottom side of the platform; and

(c) a second strut pivotally attached to the bottom side of the platform adjacent the other end thereof and extending diagonally downward for engagement with the rung of the ladder with which the first strut is engaged.

5,181,583

LADDER-LIKE STILTS FOR CEILING WORK

Stuart M. Platt, P.O. Box 108, Burgin, Ky. 40310

Filed Nov. 18, 1991, Ser. No. 793,621

Int. Cl.[5] E06C *1/38;* **A63B** *25/00*

U.S. Cl. 182—129 **11 Claims**

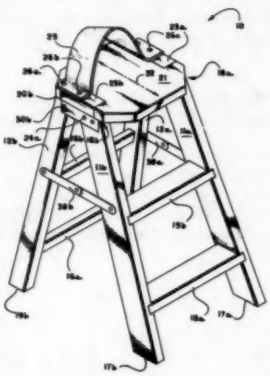
1. Apparatus comprising in combination:

a first pair of side rails having at least one step extending therebetween and having characteristic distal and proximal ends;

a second pair of side rails having characteristic distal and proximal ends;

a head step platform elongated along the direction of a predetermined foot axis;

means connecting said proximal ends of said first and second pairs of side rails to said head step platform so that said foot axis extends between said first pair of side rails and between said second pair of side rails; and



a boot defining a predetermined foot insertion axis and being connected to the upper surface of said head step platform so that said foot axis is substantially parallel to said foot insertion axis.

5,181,584

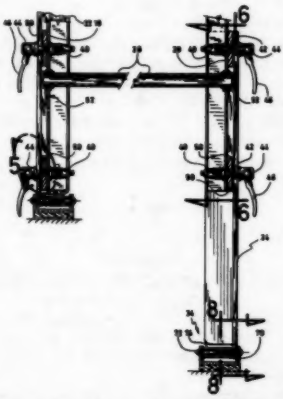
LADDER LEVELING ADAPTER

Yves M. Simard, 410, Route 381, Ferland, Quebec, Canada G0V 1H0

Filed Mar. 16, 1992, Ser. No. 851,580

Int. Cl.[5] E06C *7/00*

U.S. Cl. 182—201 **6 Claims**



1. A ladder leveling adapter for a ladder having two side rails and a plurality of connecting rounds joining said side rails, said adapter comprising,

- an elongated bar adapted to be mounted over each of said rails and to extend below said rails, said bars being provided with a median slot parallel to said rails,
- a pair of spacers adapted to be mounted between each of said rails and said bars, on each side of one of said rounds,
- a rod slidingly mounted through each of said spacers, said rods extending through said slots and said rails,
- a nut threadedly mounted on each of said rods for abutting against said rails,
- a quick release tightening means mounted on each rod for tightly and releasably abutting against said bars,

- friction means surroundingly mounted loosely around each of said rods between each of said spacers and said bars, for preventing longitudinal slipping between the bars and the rails,

whereby said bars and said rails are longitudinally and precisely adjustable relative to each other and quickly tightened and released.

5,181,585

LUBRICATING DEVICE FOR SUPPLYING SEVERAL LUBRICATING POINTS, IN PARTICULAR OF A KNITTING MACHINE, WITH LUBRICANT, PREFERABLY OIL, AND METHOD

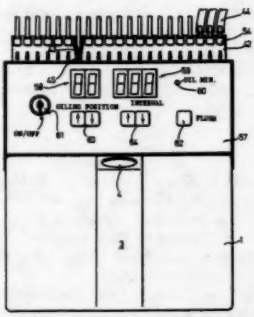
Dieter Braun, Freudenstadt; Rolf Huss, Loosburg, and Alfred Lampprecht, Betzweiler, all of Fed. Rep. of Germany, assignors to Memminger-Iro GmbH, Freudenstadt, Fed. Rep. of Germany

Filed Feb. 5, 1992, Ser. No. 831,466

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1991, 4104793

Int. Cl.[5] F16N *27/00*

U.S. Cl. 184—7.4 **21 Claims**



1. Lubricating device for supplying with lubricant, optionally oil, a plurality of lubricating points or positions, especially for use in a knitting machine, having

a lubricant supply container (**1**);

a single common electromagnetically actuable pulse lubricating pump (**9, 10, 11**) for said plurality of lubricating points or positions, said pump having a suction side connected to said supply container, and discharging a predetermined amount of lubricant at a predetermined pressure for each operating pulse;

a plurality of lubricating pipe connecting devices (**27, 29**) for lubricating pipes which lead to the individual lubricating points or positions;

a lubricant distributor (**16**) including

a lubricating supply means (**24**) connected to the pressure side of said single lubricating pump;

a plurality of outlet means (**26**), each of said outlet means leading to an individual lubricating pipe connection device (**27, 29**), and

a movable distributor element (**21**) for establishing a fluid connection between the lubricant supply means (**24**) and the selected outlet (**26**);

controllable positioning means (**40**) coupled to said distributor element (**21**) to position the distributor element to establish a connection between the lubricant supply means (**24**) and the respectively selected lubricant outlet means (**26**) associated with a respective lubricant pipe connecting device, and hence a lubricating point or position; and

a settable electric control device (**56, 57**) connected to and controlling said controllable positioning means for controlling

a) lubricant supply to a selected lubricant point or position; and

b) the time duration of flow of said lubricant supply to the selected lubricant point or position,

and, sequentially, controlling lubricant supply and time duration of lubricant flow to selected lubricant points or positions in a sequence determined by said control device (**56, 57**) as determined by the selected setting of said control device.

5,181,586

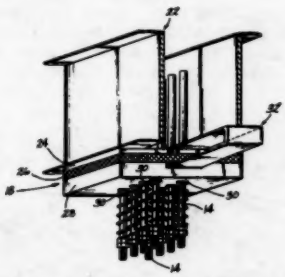
NOISE AND VIBRATION REDUCTION AT ELEVATOR CAB HITCH

Young S. Yoo, Avon, and John K. Salmon, South Windsor, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Sep. 13, 1991, Ser. No. 759,287

Int. Cl.[5] B66B *9/00*

U.S. Cl. 187—1 A **4 Claims**



1. A hitch plate assembly for an elevator, said assembly comprising:

a) first and second horizontal metal plates having a plurality of aligned openings;

b) an elastomeric pad interposed between said metal plates and operable to vibrationally isolate said plates from each other, said pad having a plurality of openings therein corresponding to the aligned openings in said plates;

c) elevator suspension means extending through said plate and pad openings, said suspension means being sized so as to be free of contact with said plates and pad in said openings; and

d) spring means interconnecting said plates, said spring means providing a connection having vertical flexibility between said plates and concurrent horizontal rigidity sufficient to prevent lateral shifting of said plates relative to each other whereby said suspension means are maintained free of said contact with said plates during operation of the elevator.

5,181,587

LOCK INDICATOR FOR CASTER

Kawanabe Masatoshi, Tokyo, Japan, assignor to Sugatsune Industrial Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1991, Ser. No. 666,520

Claims priority, application Japan, May 23, 1990, 2-53865[U]

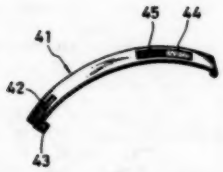
Int. Cl.[5] B60B *33/00*

U.S. Cl. 188—1.12 **4 Claims**

1. In a lock indicator for a caster having a wheel and a push-button engaged in a push-button mounting hole formed from the outer periphery of a frame to the interior of the frame, said push-button being freely pressed for operating a stopper for locking said wheel

said push-button being a cap-shaped body and being mounted within said push-button mounting hole, a transparent portion formed on a top portion of said push-button, and an indicator having indicating portions for re-

spectively indicating a wheel locking state and a wheel lock releasing state in such a manner that the indicating portions of said indicator correspond to the transparent



portion of said push-button, said indicator being internally mounted along an inner peripheral surface of said cap-shaped body to the top portion of said push-button, and one end of said indicator being secured into the frame.

5,181,588

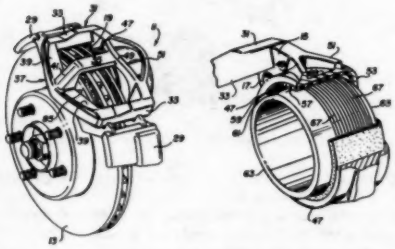
OPEN FRAMEWORK DISC BRAKE CALIPER HAVING AN ELASTOMERIC CYLINDER LINER

J. Bruce Emmons, 1711 W. Hamlin Rd., Rochester, Mich. 48309

Filed May 6, 1991, Ser. No. 696,425

Int. Cl.[5] F16D *35/00*

U.S. Cl. 188—73.31 **13 Claims**



1. A disc brake caliper comprising a unit cast body including an inboard support;

an outboard support spaced from said inboard support as a part of said body;

an open framework as a part of said body rigidly interconnecting said inboard and outboard supports;

a brake cylinder having a closed end wall formed on and a part of and projecting through said inboard support arranged inwardly of said framework and having a bore with an open end, extending on a longitudinal axis;

a liner of elastomeric material encompassing substantially the entire cylinder wall of and bonded to said bore and having a smooth cylindrical surface; and

a piston compressively and yieldably nested and sealed within said liner.

5,181,589

REVERSIBLE IMPACT DAMPER, IN PARTICULAR FOR VEHICLES

Helge Siegner, Altdorf-Röthenbach, and Edgar Prottengeier, Nürnberg, both of Fed. Rep. of Germany, assignors to Suspa Compart AG, Altdorf, Fed. Rep. of Germany

Filed Sep. 6, 1991, Ser. No. 755,902

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1990, 4028448

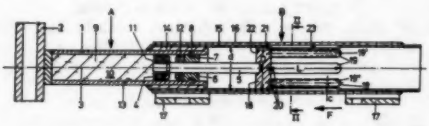
Int. Cl.[5] F16F *7/12*

U.S. Cl. 188—374 **8 Claims**

1. An impact damper, in particular for vehicles, comprising:

a reversible impact damper (A) with a housing (1) having a central longitudinal axis (3), with a damping medium, in particular a compressible solid (10), in said housing (1), with a piston rod (5) arranged displaceably in the direction of said axis (3) of said housing (1) and having a first end located outside said housing (1), and a second end located within said housing (1), to which second end a piston (4) is secured, which piston (4) introduces forces into said damping medium (10) to be absorbed by said damping medium (10);

an irreversible deformation damper (B), with a slide tube (15) with an internal wall and being displaceable relative to said housing (1) in the direction of said axis (3), with



projections (19) at said internal wall in the form of crimps (19, 19', 19'') extending substantially parallel to said axis (3), being directed inwards to said axis (3), and being deformable outwards radially to said axis (3), with a deformation piston (18) resting against said first end of said piston rod (5) and against ends of said projections (19) facing the deformation piston (18); and

securing elements (2, 17), being connected with said housing (1) on the one hand and with said slide tube (15) of said deformation damper (B) on the other hand.

5,181,590

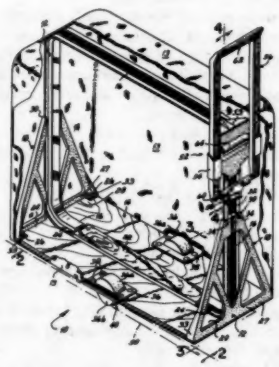
LUGGAGE FRAME WITH PULL HANDLE

Lester E. Carpenter, Middletown; Wayne I. Schmitt, Coventry, both of R.I.; Laurence Snell, Attleboro, Mass.; David Bieber, East Greenwich; Donald W. Stucke, Warren, both of R.I., and Jeremy S. Waltzer, Attleboro, Mass., assignors to American Tourister, Inc., Batesville, Ind.

Continuation-in-part of Ser. No. 487,459, Mar. 2, 1990, Pat. No. 5,048,649. This application Mar. 14, 1991, Ser. No. 669,382

Int. Cl.[5] A45C *5/14, 13/04, 13/22*

U.S. Cl. 190—18 A **20 Claims**



10. A luggage frame comprising

a floor having a pair of ends and side edges extending therebetween;

a channel-shaped main frame including means for attaching to said floor and being constructed and disposed such that it projects from the floor;

a pair of A-frame brackets, each A-frame bracket including flanges at its base angles which extend around the side

edges of said floor and including means for attaching at its base to an end of said floor and means forming a projection at its apex extending into said channel-shaped main frame, each said A-frame bracket including means forming a slot at its base into which an end of said floor extends and is captured therein;

a pair of major wheels rotatably mounted on transverse axles, said axles including means for fixing to said floor, said wheels projecting below said floor and being centered on the side edges of said floor generally longitudinally between said ends of said floor;

a pair of minor wheels mounted to said floor and projecting below said floor, each minor wheel being disposed adjacent one of said ends thereof;

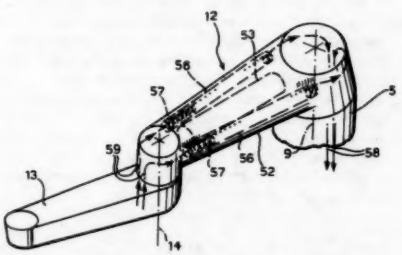
a pull handle assembly mounted to one end of said main frame comprising a pull handle slide, a pull handle including means for sliding in said pull handle slide between a retracted and an extended position, said pull handle being a rectangle including a transverse hand grip at one end and an oblong-shaped transverse bar at the other end, a flat spring secured to said oblong-shaped transverse bar, and a spring clip including means for securing to said pull handle slide for receiving said oblong-shaped transverse bar in the handle extended position, said pull handle being rotatable in said spring clip whereby said pull handle may be disposed at a desired angle of inclination for pulling of the luggage frame, said flat spring including means for returning said pull handle to a vertical position when released.

5,181,591

ARRANGEMENT FOR THE ELECTRICAL CABLES OF AN ARTICULATED ROBOT ARM

Mauro Zona, and Marco Bettinardi, both of Turin, Italy, assignors to Comau SpA, Turin, Italy

Filed Oct. 3, 1991, Ser. No. 770,279
Claims priority, application Italy, Oct. 4, 1990, 67761 A/90
Int. Cl.[5] H02G *11/00*
U.S. Cl. 191—12 R **2 Claims**



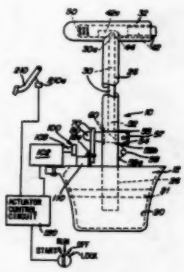
1. An articulated robot having stationary electrical supply means, said robot comprising at least one robot arm articulated at one end to a support structure and at its other end to a further movable member carrying electrical equipment, and at least two electrical cables which extend through the arm to connect the stationary electrical supply means to the electrical equipment in the further movable member, wherein the electrical cables are constituted by two resiliently-extensible helical cords arranged longitudinally along two sides of the arm in a plane substantially perpendicular to the axes of articulation of the ends of the arm, each of the helical cords having one end portion fixed to the support structure on which the arm is rotatable and its opposite end portion fixed to the corresponding end of the arm so that any rotation of the arm relative to its support structure lengthens one of the two cords and shortens the other cord correspondingly.

5,181,592

SHIFT LEVER INTERLOCK SYSTEM

Greg R. Pattock, Spring Lake, Mich., assignor to Sparton Corporation, Jackson, Mich.

Filed Jun. 11, 1990, Ser. No. 535,754
Int. Cl.[5] B60K *41/28*
U.S. Cl. 192—4 A **40 Claims**



1. A shift lever interlock system for a vehicle having a transmission with a shift lever, comprising:

(a) a shift lever means movable between a non-drive position and a drive position,

(b) detent means for releasably retaining the shift lever means in a selected position,

(c) an electrical actuator for moving a locking member to a locking position relative to the detent means when the shift lever is retained in the non-drive position by the detent means to prevent movement of the shift lever by the vehicle operator, said actuator including first limit switch means for providing to a control circuit a first input signal representative of said locking member being in the locking position and second limit switch means for providing to the control circuit a second input signal representative of said locking member being in an unlocking position relative to said detent means,

(d) means for providing to the control circuit a shift lever position input signal representative of said shift lever being retained in the non-drive position by the detent means,

(e) means for providing to the control circuit at least one vehicle system input signal representative of a vehicle system being in a predetermined condition, and

(f) said control circuit controlling the actuator in response to the input signals to lock the shift lever as retained in the non-drive position except if the vehicle system is in the predetermined condition.

5,181,593

CLUTCH WEAR INDICATOR APPARATUS

Richard A. Flotow, Butler, and J. Michael Lewis, Corunna, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Feb. 18, 1992, Ser. No. 837,264
Int. Cl.[5] F16D *66/02, 23/14*
U.S. Cl. 192—30 W **19 Claims**

1. A clutch comprising:

a flywheel;

a cover connected to said flywheel for rotation therewith;

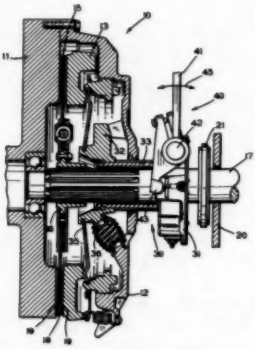
a pressure plate disposed between said flywheel and said cover for rotation therewith and for axial movement relative thereto between engaged and disengaged positions;

an output shaft;

a driven disc assembly mounted on said output shaft for rotation therewith and disposed between said flywheel and said pressure plate, said driven disc assembly including friction elements which are engaged by said flywheel and said pressure plate when said pressure plate is moved to said engaged position;

a retainer assembly disposed about said output shaft and movable between engaged and disengaged positions for moving said pressure plate between said engaged and disengaged positions;

a shift assembly selectively engageable with said retainer assembly for effecting movement of said retainer assembly



and said pressure plate between said engaged and disengaged positions; and

means mounted on said retainer assembly and responsive to the relative positions of said retainer assembly and said shift assembly for generating a signal when said friction elements have become excessively worn.

5,181,594

CLUTCH ASSEMBLY

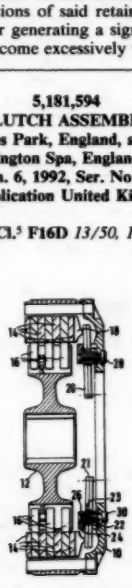
Ian A. Nash, Woodloes Park, England, assignor to Automotive Products plc, Leamington Spa, England

Filed Jan. 6, 1992, Ser. No. 817,355

Claims priority, application United Kingdom, Jun. 18, 1991, 9101180

Int. Cl.[5] F16D *13/50, 13/58*

U.S. Cl. 192—70.27 **7 Claims**



1. A motor vehicle multiplate clutch assembly comprising a cover, a plurality of drive plates rotationally fast with the cover, a plurality of driven plates rotationally fast with a hub and located between the drive plates, at least one diaphragm spring which acts to bias the drive plates into engagement with the driven plates, a first annular fulcrum ring on the cover for pivotally supporting the diaphragm spring on its side adjacent the cover, a second annular fulcrum ring aligned within the first fulcrum ring for pivotally supporting the diaphragm spring on its side away from the cover, and a plurality of spacers extending between the second fulcrum ring and the cover, wherein the spacers are formed integrally with the second fulcrum ring with the top faces of the spacers adjacent the cover machined to a predetermined height above the fulcrum ring, and the second fulcrum ring is attached to the cover by detachable attaching members each securing one of the spacers to the cover.

5,181,595

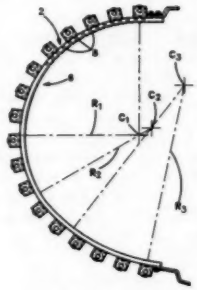
ROLLER SUPPORTING ASSEMBLY FOR ESCALATOR OR MOVING WALKWAY HANDRAIL NEWELS

Walter Tietze, and Hella Badstuebner, both of Stadthagen, Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Jun. 16, 1992, Ser. No. 899,194

Int. Cl.[5] B65G *15/00*

U.S. Cl. 198—335 **6 Claims**



1. A guide assembly for guiding movement of a handrail over a newel portion of an escalator or moving walkway, said assembly comprising:

a) an elongated metal channel member having a generally U-shaped cross-sectional configuration with a medial wall portion and opposed side walls depending substantially at right angles from opposite edges of said medial wall portion, said side walls each being provided with a plurality of slots therein extending from free edges of said side walls toward said medial wall portion, said slots being operable to increase the bendability of said channel member;

b) a plurality of handrail-contacting and guiding components secured to said medial wall portion at spaced-apart locations therealong for contacting and guiding movement of the handrail through the newel portion; and

c) said channel member side walls being spaced apart a distance substantially equal to the thickness of a balustrade component of the escalator or moving walkway whereby the channel member can be easily forced into clamping engagement with the balustrade at the newel portion-defining edge thereof.

5,181,596

OFF-LOADING CONVEYING SYSTEM

A. James Warkentin, 13551 View Dr., Orange Cove, Calif. 93646

Continuation-in-part of Ser. No. 601,137, Oct. 19, 1990, abandoned. This application May 8, 1991, Ser. No. 697,327

Int. Cl.[5] B65G *37/00*

U.S. Cl. 198—365 **61 Claims**

1. A conveyor comprising

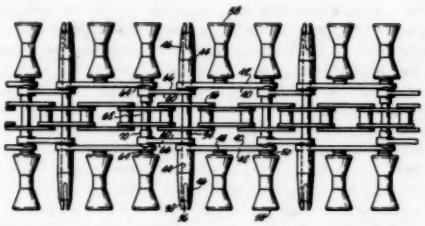
a support structure defining a conveying path;

an endless chain mounted on said support structure to extend along said conveying path;

roller carriages movably mounted on said chain;

rollers rotatably mounted to said roller carriages, said rollers extending laterally of said chain and defining cavities for conveying along said conveying path, said roller carriages being movably mounted to move selectively said rollers downwardly away from said conveying path;

elongate members mounted to said chain and extending laterally of said chain, said elongate members being positioned higher than said rollers when on said conveying path;



control members mounted on said chain to selectively control movement of said roller carriages.

5,181,597

CONVEYOR- AND DISTRIBUTION PLANT

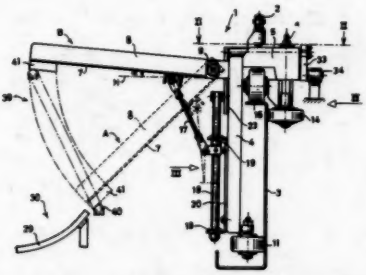
Jan C. Geerts, Heemskerk, Netherlands, assignor to Promech Sorting Systems B.V., Netherlands

Filed Jan. 21, 1992, Ser. No. 823,661

Claims priority, application Netherlands, Jan. 23, 1991, 9100108

Int. Cl.[5] B65G *47/46*

U.S. Cl. 198—365 **7 Claims**



1. A conveyor in a plant for transporting and discharging a load, in which said plant includes a frame, a closed track circuit and an endless conveyor which passes along said frame through said closed track circuit, said conveyor comprising:

at lest one carrying surface (7) for said load;

a hinge pin (9) for hingedly supporting said carrying surface for pivotal movement of said surface between an essentially horizontally directed conveying position (B) and a discharge position (A);

a locking mechanism (23) releasably locking said carrying surface in said conveying positions (B);

said carrying surface forming part of a conveyor unit (1), said conveyor unit (1) including a main back plate (4) and trolley rollers (11, 14, 15) for moving along a frame (3) by means of an endless conveyor (2), said hinge pin (9) of said carrying surface (7) being mounted on said back plate (4) of said conveyor unit (1);

means (26) for adjusting the discharge position (A) of said carrying surface (7); and

a damping element (16) for controlling the speed of pivotal movement of said carrying surface (7) from said conveying position (B) to sad discharge position (A).

5,181,598

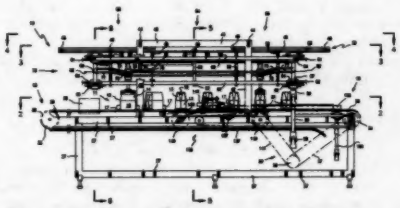
ARTICLE ROTATING ASSEMBLY

Jeffrey A. Lashyro, Crosby, and Robert J. Bitner, Nisswa, both of Minn., assignors to Riverwood International Corporation, Denver, Colo.

Filed Oct. 3, 1991, Ser. No. 771,151

Int. Cl.[5] B65G *47/24*

U.S. Cl. 198—377 **18 Claims**



18. In an article conveyance assembly having conveyance means, an article rotating assembly comprising:

a) a frame structure,

b) a pair of driven endless chains disposed in generally parallel planes within said frame structure,

c) article engaging means,

d) vertical motion means, including a lower cam track, operative on said article engaging means,

e) rotational motion means, including an upper cam track, operative on said article engaging means, said vertical and rotational motion means being synchronized with said conveyance means,

f) vertically disposed flight shafts connected between said chains,

g) an upper rotating block having a vertically extending splined interior aperture and a first cam roller attached thereto, said upper rotating block being connected to said flight shaft, and

h) a sliding block structure constructed and arranged for vertical movement with respect to said flight shafts and having a second cam roller attached thereto and further having a piston shaft coupled thereto, said piston shaft having a splined upper end portion for slidingly engaging said splined interior of said upper rotating block, said article engaging means being mounted at a bottom end of said position shaft.

5,181,599

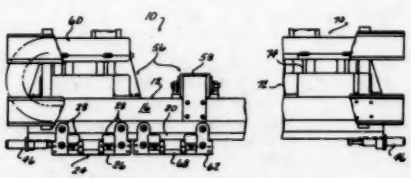
DUAL-BELT SHUTTLE UNIT

John A. Blatt, 22 Stratton Pl., Grosse Pointe Shores, Mich. 48236

Filed Jan. 2, 1991, Ser. No. 636,628

Int. Cl.[5] B65G *15/58*

U.S. Cl. 198—468.6 **10 Claims**



1. A power-driven shuttle comprising:

a single elongated bracket having first and second ends, said bracket substantially C-shaped and having an elongate vertical member and opposing horizontal members extending transversely from each end of said vertical member, and each of said horizontal members having a rail

fixedly attached to an outer surface of said horizontal members, extending parallel to said vertical member;

at least one carriage means for transporting a lift unit in a horizontal plane along said bracket, said carriage means further including a carriage plate slidably received about said bracket, a plurality of rollers at opposing ends of said plate engaging said rails to guide said carriage means in horizontal movement relative to said bracket, at least one L-shaped bracket fixedly secured to an interior surface of said carriage plate, and at least one bearing block fixedly secured to said interior surface of said carriage plate;

at least one conveyor means for transporting said carriage means in said horizontal plane; and

means for connecting said carriage means in series with a plurality of said carriage means on said single bracket.

5,181,600

CONVEYOR STRUCTURE

Ian C. Chappell, 23 The Grove, Austinmer, New South Wales 2515; Peter W. G. Matusch, and Dagobert R. Matusch, both of 34 Windang Road, Primbee, New South Wales 2504, all of Australia

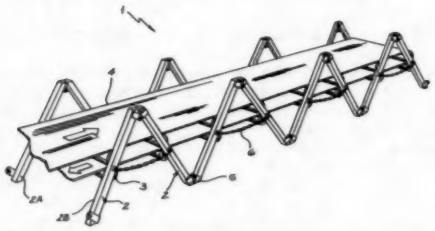
PCT No. PCT/AU90/00021, § 371 Date Sep. 23, 1991, § 102(e) Date Sep. 23, 1991, PCT Pub. No. WO90/08717, PCT Pub. Date Aug. 9, 1990

PCT Filed Jan. 23, 1990, Ser. No. 721,631

Claims priority, application Australia, Jan. 24, 1989, PJ2404; Jul. 19, 1989, PJ5384

Int. Cl.[5] B65G *21/14*

U.S. Cl. 198—812 **12 Claims**



1. A conveyor structure comprising:

a set of H-frames each comprising two substantially parallel rigid supports of equal length, and a cross-member arranged to support a conveyor belt, said H-frames being pivotally joined together in zig-zag configuration with corresponding ends of each of said rigid supports being pivotally connected, the pivot joining of said H-frames comprising a pivot axis displaced from the plane of each joined H-frame, wherein said set of frames is able to extend and retract in concertina fashion between a compact transport configuration in which the rigid supports of adjacent frames are substantially parallel and an extended zig-zag support configuration, the angular separation between adjacent frames being limited by a plurality of links extending between said frames.

5,181,601

PLASTIC CONVEYOR BELT WITH INTEGRAL SIDEPLATE

Karl V. Palmaer, 108 Winding Canyon La., Folsom, Calif. 95630, and Eric K. Palmaer, 1641 Klamath River Dr., Rancho Cordova, Calif. 95670

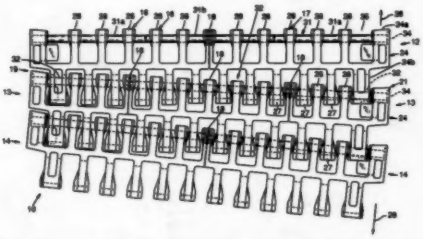
Filed Oct. 9, 1990, Ser. No. 594,623

Int. Cl.[5] B65G *15/02*

U.S. Cl. 198—831 **20 Claims**

1. In a plastic conveyor belt capable of following a path including straight and curving section and including a series of connected and serially interdigitated elongated molded plastic belt module rows each including one or more belt modules in the row, the belt module rows being connected by rods extending transversely to the length of the conveyor belt, each belt module row having a set of first aligned spaced projections extending in one direction from the row and a set of second aligned spaced projections extending an opposite direction and arranged generally in staggered relationship with the first projections, the first and second projections of serially adjacent module rows being longitudinally overlapping and juxtaposed when the modules are connected serially in the conveyor belt by the connecting rods extending through transverse openings in the projections, the transverse openings of one of said sets of spaced projections being longitudinally elongated slotted holes to accommodate lateral curves wherein the module rows become angularly shifted and collapse together at the inside of the curve, with substantially the entire longitudinal tension of the belt from module to module carried at the outside of a curve, the improvement comprising,

at one side of each of a series of belt modules which include first and second spaced projections, an integral sideplate in a position to be at a side edge of the conveyor belt, the sideplate being integrally molded with the remainder of the plastic belt module and being generally thicker and heavier in plastic material, and stronger in longitudinal tension, throughout its length, than the first and second spaced projections,



the integral sideplate including a first sideplate projection and a second sideplate projection laterally offset from each other and generally in positions corresponding to those of said first spaced projections and second spaced projections of the row, respectively, such that the first sideplate projection will extend to the extreme outer side edge of the assembled conveyor belt and the second sideplate projection will be inwardly offset from the first, in position to be engaged between a first sideplate projection and one of said first spaced projections of a serially adjacent belt module in the assembled conveyor belt, and the first and second sideplate projections having transverse openings aligned with those of the first and second spaced projections, to receive a connecting rod,

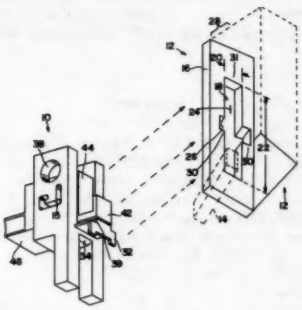
the heavier plastic material of the integral sideplate serving to enhance the strength of the belt in longitudinal tension at the outside of a curve and not serving to resist to any appreciable degree any connecting rod elongation forces which may be present, which would act in a lateral direction in the modules,

whereby the need for a separate, non-integral sideplate is avoided, with the interconnected modules and the conveyor belt given strength by the integral sideplates, receiving essentially all of the belt's tension at the outside of a curve.

5,181,602
LOCKOUT DEVICE FOR HIGH VOLTAGE CIRCUIT BREAKER

Lawrence J. Kozlowski, New Kensington, and Lawrence A. Shirey, North Huntingdon, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 18, 1991, Ser. No. 761,437
Int. Cl.[5] H01H *9/28*
U.S. Cl. 200—43.015 **15 Claims**



1. A lockout assembly for locking a circuit breaker in a selected off or on position, the circuit breaker having a switch handle with a free end, the circuit breaker having an upper housing wall having a slot through which the free end of the switch handle projects, the slot in the upper housing wall having a width and a length sufficient to permit the free end of the switch handle to move from an on to an off position and vice versa, the slot having a groove perpendicular to its length, there being a clearance space under the upper housing wall adjacent to the slot, said lockout assembly comprising:

first means for engaging a first portion of the upper housing wall, including groove-entering first foot means for entering the groove of the slot, for sliding under a first portion of the upper housing wall in a portion of the clearance space under the upper housing wall adjacent to the slot, and for engaging the first portion of the upper housing wall, said first housing wall engaging means also including means for blocking switch handle motion, said switch handle motion blocking means connected to said groove-entering first foot means, said first housing wall engaging means also including a wall, said first engaging means wall connected to said switch handle motion blocking means and including a first hole, and

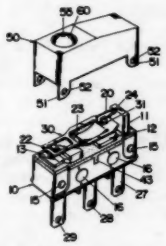
second means for engaging a second portion of the upper housing wall, said second housing wall engaging means including second foot means for entering the non-grooved portion of the slot and sliding under the second portion of the upper housing wall in a portion of the clearance space under the upper housing wall adjacent to the slot, said second housing wall engaging means also including a main body portion connected to said second foot means, said main body portion including a second hole, and said second housing wall engaging means also including a handle means connected to said main body portion, said handle means for moving said second hole into registration with said first hole and for moving said second foot means away from said groove-entering first foot means and into engagement with the second portion of the upper housing wall,

wherein, when said first hole and said second hole are in registration, they are capable of receiving a shank or jaws of a locking device which prevents said groove-entering first foot means and said second foot means from disengaging from engagement with the first portion and the second portion of the upper housing wall, respectively, whereby a switch-throwing motion of the circuit breaker switch handle is prevented.

5,181,603
SEALED ELECTRIC SWITCH

Hidetaka Mori; Yasunari Takedomi, both of Tsu, and Takao Morimoto, Hisai, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Dec. 10, 1990, Ser. No. 629,654
Claims priority, application Japan, Dec. 25, 1989, 1-148930; Dec. 25, 1989, 1-148931
Int. Cl.[5] H01H *13/06, 9/04*
U.S. Cl. 200—302.1 **5 Claims**



1. A sealed electric switch comprising:

a molded switch housing with contacts and terminals;

a separately formed cover which is fitted on said molded switch housing in mating contact between peripheries of said switch housing and said cover;

an annular seal member disposed on a peripheral mating surface of said switch housing so as to effect a sealing between said switch housing and said cover, said annular seal member being injection-molded from an elastic material on said peripheral mating surface of said molded switch housing between separable molding dies with said switch housing held therebetween; and

said annular seal member integrally formed with at least one bridge segment which bridges opposed ends of said annular seal member in a separating direction of said molding dies.

5,181,604
CONTACT LENS HOLDER AND TREATING DEVICE

Kiyohiko Ohta, Aichi; Kaoru Kamiya, Nagoya; Keiko Watanabe, Inazawa; Makoto Nakagawa, Aichi, and Tomio Nagao, Gifu, all of Japan, assignors to Tomei Sangyo Co., Ltd., Japan

Filed Sep. 9, 1991, Ser. No. 756,883
Claims priority, application Japan, Sep. 14, 1990, 2-97121[U]
Int. Cl.[5] A45C *11/04*
U.S. Cl. 206—5.1 **12 Claims**

1. A contact lens case for accommodating a contact lens, comprising:

a cylindrical container body closed at one axial end, for receiving a liquid for treating the contact lens;

a cap member removably attached to the other axial end of said container body to fluid-tightly close an opening of the body, so that an enclosed space is defined between said cap member and said container body;

a support member which is attached at one end thereof to the inside of said cap member, and which extends from said cap member into said enclosed space in an axial direction of said container body;

a lens holder rotatably supported at the other end of said support member and accommodated in said enclosed space, said lens holder comprising a plate member and at least one cover forming at least one lens storage chamber each for receiving the contact lens, said lens holder having

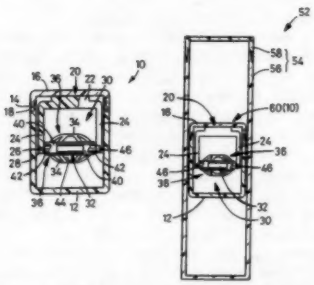
a plurality of through-holes which permit said liquid to flow therethrough; and

detent means disposed between said lens holder and said support member for preventing said lens holder from freely rotating in said enclosed space, and for holding said lens holder selectively in a horizontal position in which said lens holder has a horizontal posture substantially perpendicular to said axial direction of said container body, or a vertical position in which said lens holder has a vertical posture substantially parallel to said axial direction of the container body, so that the contact lens received in said at least one lens storage chamber has a horizontal attitude substantially perpendicular to said axial direction of the container body when said lens holder is held in said horizontal position, and a vertical attitude substantially parallel to said axial direction of the container body when said lens holder is held in said vertical position.

8. A lens treating device for treating a contact lens, comprising:

an elongate cylindrical outer case having a cylindrical body which is open at at least one of opposite axial ends, and at least one lid removably attached to said cylindrical body to close said at least one axial end thereof; and

a contact lens case, for accommodating a contact lens, as an inner case, for fluid-tightly receiving the contact lens and a liquid for treating the contact lens, said inner case being accommodated in said outer case such that said inner case



is axially slidingly reciprocable within said outer case, whereby said liquid is forced to flow within said inner case so as to clean the contact lens, by a reciprocating movement of said inner case when said outer case is axially shaked or repeatedly inverted, said contact lens case comprising:

a cylindrical container body closed at one axial end, for receiving a liquid for treating the contact lens;

a cap member removably attached to the other axial end of said container body to fluid-tightly close an opening of the body, so that an enclosed space is defined between said cap member and said container body;

a support member which is attached at one end thereof to the inside of said cap member, and which extends from said cap member into said enclosed space in an axial direction of said container body;

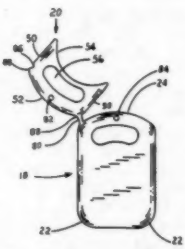
a lens holder rotatably supported at the other end of said support member and accommodated in said enclosed space, said lens holder comprising a plate member and at least one cover forming at least one lens storage chamber each for receiving the contact lens, said lens holder having a plurality of through-holes which permit said liquid to flow therethrough; and

detent means disposed between said lens holder and said support member for preventing said lens holder from freely rotating in said enclosed space, and for holding said lens holder selectively in a horizontal position in which said lens holder has a horizontal posture substantially perpendicular to said axial direction of said container body, or a vertical position in which said lens holder has a vertical posture substantially parallel to said axial direction of the container body, so that the contact lens received in said at least one lens storage chamber has a horizontal attitude substantially perpendicular to said axial direction of the container body when said lens holder is held in said horizontal position, and a vertical attitude substantially parallel to said axial direction of the container body when said lens holder is held in said vertical position, said detent means holding said lens holder in said vertical position so that the contact lens received in said lens holder has said vertical attitude when the lens is put into or taken out of said lens holder, and holding said lens holder in said horizontal position so that the contact lens has said horizontal attitude during cleaning of the contact lens.

5,181,605
KEY COVER

Thomas R. Bishop, Spring Lake; Richard A. Thom, Muskegon, and Frank L. Breveglieri, Spring Lake, all of Mich., assignors to Pliant Plastics Corporation, Muskegon, Mich.

Continuation-in-part of Ser. No. 667,809, Mar. 12, 1991, Pat. No. 5,083,662. This application Oct. 25, 1991, Ser. No. 782,419
The portion of the term of this patent subsequent to Jan. 28, 2009, has been disclaimed.
Int. Cl.[5] E05B *19/04*
U.S. Cl. 206—37.1 **18 Claims**



1. A key cover for a key of the type including an elongated blade and a wider head, said key cover comprising a body having a cavity therein for receiving a key head, said body also having an opening into the cavity through one end thereof, said opening being configured to receive a key head, and a slot at an opposite end thereof in communication with the cavity for receiving a key blade, means pivotally mounting a plug to the body adjacent to the opening, said plug being configured to fit snugly in the opening and be pivoted into the opening and means for securing the plug in the opening.

5,181,606
SOAP DISH

Steve Martell, 12201 S. Oglesby, Chicago, Ill. 60633

Filed Dec. 26, 1991, Ser. No. 813,475
Int. Cl.[5] A47K *5/04*
U.S. Cl. 206—77.1 **4 Claims**

1. A standing soap dish comprising:

a. a plurality of substantially parallel ribs, each of the plurality of ribs having a rear portion and a front portion, each of the rear portions longer than the front portions and elevated to support a bar of soap, each of the front portions connected to one of the rear portions and elevated to keep the bar of soap in the soap dish;

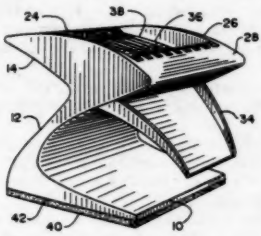
b. a bar attached to each of the plurality of ribs at the front portion;

c. a plate attached to each of the plurality of ribs at the rear portion;

d. a pair of end pieces, each disposed substantially parallel to the ribs and at opposite sides of the ribs, the end pieces

raised to keep the bar of soap from falling off the ribs at an end;

e. a web connected to the end pieces;



f. a base connected to the web; and

g. a trough connected to the plate to catch runoff and direct the runoff to a location beyond the base.

5,181,607

DIVISIBLE PACKAGE FOR A PLURALITY OF CIGARETTE PACKS

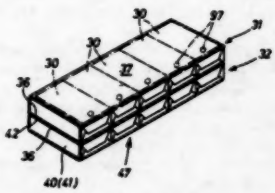
Heinz Focke, Verden, and Bernhard Focke, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Company, Verden, Fed. Rep. of Germany

Division of Ser. No. 436,003, Nov. 14, 1989, Pat. No. 5,058,363, which is a division of Ser. No. 906,637, Sep. 10, 1986, Pat. No. 4,932,534, which is a continuation of Ser. No. 599,157, Apr. 11, 1984, abandoned. This application Jun. 3, 1991, Ser. No. 709,292

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1983, 3313462

Int. Cl.[5] B65D *85/10*

U.S. Cl. 206—273 **12 Claims**



1. A package for receiving a plurality of cigarette packs comprising:

two discrete partial packages, each of which receives a row of adjacent cigarette packs, each discrete partial package having first and second oppositely positioned covering walls, the first covering wall of one discrete partial package being connected to the first covering wall of the other discrete partial package along a severing line so that the two discrete partial packages are separable from each other along the severing line;

the first covering wall of the one discrete partial package having an outer surface and the first covering wall of the other discrete partial package having an outer surface, the outer surface of the first covering wall of the one discrete partial package facing the outer surface of the first covering wall of the other discrete partial package and the first covering wall of the one discrete partial package being releasably connectable to the first covering wall of the other discrete partial package by means of a plurality of spaced glue points that are positioned between the facing outer surfaces of the one discrete partial package and the other discrete partial package;

said severing line including a severing cut and a plurality of material connection points positioned along the severing line for connecting the first covering wall of the one discrete partial package to the first covering wall of the other discrete partial package; and

a longitudinal side wall extending between the first and second covering walls of the one discrete partial package, a side of the one discrete partial package opposite to said longitudinal side wall being open so that when cigarette packs are placed in the one discrete partial package, edge faces of the cigarette packs are exposed through the open side, and a longitudinal side wall extending between the first and second covering walls of the other discrete partial package, a side of the other discrete partial package opposite to said longitudinal side wall being open so that when cigarette packs are placed in the other discrete partial package, edge faces of the cigarette packs are exposed through the open side.

5,181,608

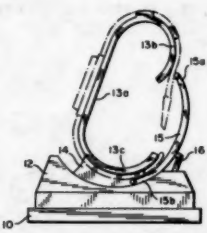
PACKAGE FOR SUPPORTING AN UNBUCKLED STRAP-TYPE WRISTWATCH

Jack L. Herzog, 5702 Durocher Street, Montreal, Canada H2V 3Y2

Filed Apr. 1, 1992, Ser. No. 861,594

Int. Cl.[5] B65D *85/40*

U.S. Cl. 206—301 **8 Claims**



1. A package for supporting and displaying a strap-type wristwatch that has a pair of straps, adapted to be buckled together when worn on the wrist of a user, without requiring that said straps be buckled together for purposes of such support and display in the package, said package including a wristwatch support member that comprises a substantially C-shaped element having an elongated central segment terminating in opposite end portions that are positionally displaced from said central segment, and strap retaining means integral with said wristwatch supporting member comprising a pair of flexible clips fixedly positioned in overlying relation to spaced portions of said C-shaped element adjacent said opposite end portions of said element, a strap-type wristwatch being held in position on said wristwatch support member by slipping the straps of the watch into said clips to retain the wristwatch on said support member without buckling the straps together.

5,181,609

DISPOSABLE RECEPTOR FOR SURGICAL SHARPS

Susan A. Spielmann, and Thomas G. Spielmann, both of Rte. 1 Box 67 Cole La., Aurora, Ind. 47001

Filed Apr. 9, 1992, Ser. No. 865,959

Int. Cl.[5] B65D *85/24*

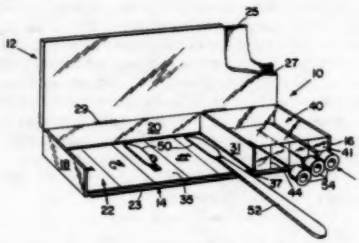
U.S. Cl. 206—370 **18 Claims**

1. A disposable device for receiving and retaining sharp implements, said device comprising:

a top member and a bottom member connected in spaced apart relationship by a plurality of adjacent peripheral walls which define a substantially enclosed receiving area therebetween, said top member having an outer magnetic surface, and at least a portion of said receiving area having a magnetic surface adjacent said bottom member;

an open edge which provides access to said receiving area for insertion and temporary storage of surgical sharps;

means located at least partially between said top and bottom members for releasably receiving and retaining surgical sharps; and



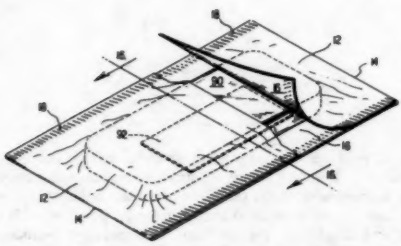
means associated with said top member for providing visual access to said receiving area.

5,181,610

FLEXIBLE CONTAINER WITH NONSTICK INTERIOR

James R. Quick, Greenwood Lake, and Robert L. Gordon, Monroe, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed May 15, 1992, Ser. No. 883,747
Int. Cl.[5] B65D *30/02*
U.S. Cl. 206—447 **5 Claims**



1. A pouch for the packaging of products having a pressure sensitive adhesive thereon, the pouch formed of at least one sheet having a silicone coating on a surface thereof, said silicone coating covering at least a portion of the interior surfaces of the pouch, the pouch having at least one edge seam which at least partially surrounds the interior of the pouch, said seam including the lamination of two overlapped edge zones, at least one said overlapped edge zone having a silicone coating, said edge seam including a plurality of discrete embossments, said embossments deforming both of said overlapped edge zones.

5,181,611

CORNER POST HAVING LAMINATED PAPERBOARD SPINE

Henry L. Liebel, 10 Tower Dr., Newport, Ky. 41071

Filed Dec. 16, 1991, Ser. No. 808,376
Int. Cl.[5] B65D *85/48*
U.S. Cl. 206—453 **6 Claims**

1. An integral, elongated corner post for cushioning and protecting an edge of an article comprising, in combination:

a paperboard member formed into an elongated rigid right angle and having a pair of legs joined at an apex, said member having an inside surface and an outside surface,

a paperboard spine formed into an elongated rigid right angle and secured to the outside surface of said paperboard member at said apex,

said spine comprising a pair of legs and having an inside surface and an outside surface, said legs of said spine being folded inwardly upon and laminated to themselves to define a portion of increased thickness, the inside surface of said portion of increased thickness being laminated to the outside surface of said paperboard member,

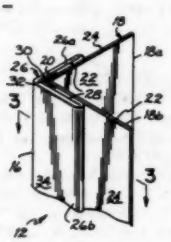
the remainder of the inside surface of said spine being laterally offset from the outside surface of said paperboard member defining a void therebetween, and

an adhesive within the void at said apex of said paperboard member.

6. A stacked array of integral, elongated corner posts for cushioning and protecting the edges of articles comprising, in combination:

a plurality of paperboard members, each formed into an elongated rigid right angle and having a pair of legs joined at an apex, each said member having an inside surface and an outside surface,

a paperboard spine formed into an elongated rigid right angle and secured to the outside surface of each said paperboard member at said apex,



said spine comprising a pair of legs and having an inside surface and an outside surface, said legs of said spine being folded inwardly upon and laminated to themselves to define a portion of increased thickness, the inside surface of said portion of increased thickness of said spine being laminated to the outside surface of said paperboard member,

the remainder of the inside surface of said spine being laterally offset from the outside surface of said paperboard member defining a void therebetween,

an adhesive within the void at the apex of said paperboard member,

each said paperboard member having a contact adhesive on the inside surface of their respective legs, outboard of the legs of said spine,

each said spine spacing the legs of adjacent paperboard members one from another to prevent contact of the adhesive on one paperboard member from an adjacent paperboard member in said stacked array.

5,181,612

COMPACT COLLAPSIBLE LUNCH BOX

Yuan W. Liu, 1031 Denise Street, Timmins, Ontario, Canada P4P 1C3

Filed Oct. 25, 1991, Ser. No. 782,653
Int. Cl.[5] A45C *11/20*
U.S. Cl. 206—546 **9 Claims**

1. A compact collapsible lunch box comprising,

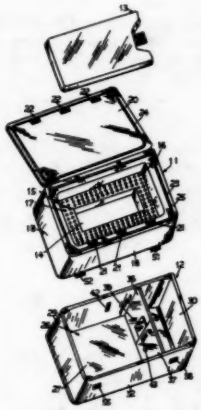
a carrier body member having a cover means hingedly provided on a top portion therein, said carrier body member having a well portion formed in said top portion and a bottom casing portion formed in a bottom portion therein,

said well portion and said bottom casing portion being in communication with each other through at least a rectangular opening formed at a base of said well portion,

a collapsible container member operatively and removably mounted in said bottom casing portion of said carrier body member, said container member having foldable side walls operative to position in a manner perpendicular to a bottom panel in said container member to form a substantially rectangular container therewith,

a plurality of securing web means disposed in the bottom edges of said bottom casing portion,

a plurality of associated securing web means disposed on the



side walls of said container member, said securing web means and associated securing web means being operative to secure removably together said carrier body member and said container member.

5,181,613

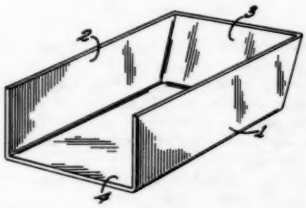
PEDI PAN

Bruce A. Wright, 138 Roy Thomason Rd., Simpsonville, S.C. 29681

Filed Apr. 17, 1991, Ser. No. 686,409

Int. Cl.[5] B65D *1/34*

U.S. Cl. 206—567 **5 Claims**



1. A manicuring pan for catching fingernails and toenails and other debris as nails are cut comprising: pan having bottom surface and front walls and two side walls so as to form a generally rectangular shaped pan with an open side, the underside of said bottom surface having a frictional member so as to keep said pan steady while in use.

5,181,614

COIL DUNNAGE AND PACKAGE USING SAME

Ridley Watts, 34000 Cedar Rd., Gates Mills, Ohio 44040

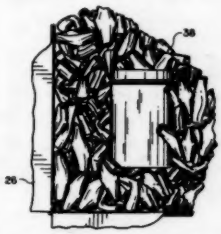
Filed Apr. 5, 1991, Ser. No. 681,087

Int. Cl.[5] B65D *85/30*

U.S. Cl. 206—584 **11 Claims**

1. A container, an article within the container, and a multiplicity of randomly oriented separate coils of thin, flexible, resilient strips within the container at least partially surrounding the article, said coils having overlapping, unsecured convolutions, the convolutions of each coil having a common axis, said coils being relatively small with respect to the container and the article and substantially isolating the article from direct contact with the container.

11. A container, an article within the container, and a plural-



ity of randomly oriented separate coils, each of said coils being wound in a loose coil shape having overlapping, unsecured convolutions, each successive convolution at least partially overlapping all preceding convolutions.

5,181,615

PLASTIC CLOSURES FOR CONTAINERS AND CANS AND METHODS OF AND APPARATUS FOR PRODUCING SUCH CLOSURES

Mortimer S. Thompson, Maumee, Ohio, assignor to Innovative Closures, Inc., Maume, Ohio

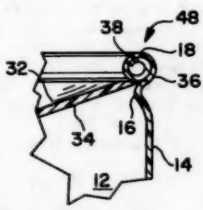
Division of Ser. No. 115,445, Oct. 30, 1987, Pat. No. 4,975,132.

This application Sep. 17, 1990, Ser. No. 583,290

The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.

Int. Cl.[5] B65D *6/28, 7/16*

U.S. Cl. 220—618 **15 Claims**



1. A container comprising:

a body having a free end of plastic,

an end portion having a central portion and a peripheral skirt including a free end of plastic, and

said free ends being in juxtaposition and continuously flexed to form a curled double wall seam of plastic which joins said end portion to said body, and wherein at least one of said curled free ends of plastic includes developed stress along its length which causes said free ends to maintain engagement therebetween wherein during curling said at least one free end which includes developed stress is maintained at a temperature below its softening point.

5,181,616

GRAIN PROCESSOR

Dominique Le Gigan, La-Garenne, France, assignor to Star Partners, Chicago, Ill.

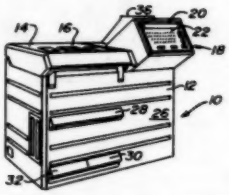
Filed Mar. 8, 1991, Ser. No. 666,782

Int. Cl.[5] B07B *9/00*

U.S. Cl. 209—31 **16 Claims**

1. A grain processor for separating and measuring components of a test sample of grain as well as separating impurities from the grain and separating different size impurities comprising, a motor driven rotary sieve for receiving said test sample and having at least two sieving sections, each provided with

different size perforations, a plurality of densimetric separator columns, means for directing sieved portions of the sample to said densimetric separator columns, a plurality of motors, a motor driven blower associated with each column for separating the impurities from the grain or different size impurities, a weighing hopper coupled to an output of each column for weighing the separated grain and provided a weight signal, a processing unit provided with data processing and recording circuits including microprocessor means, rotation control circuits associated with said blowers and said rotary sieve



coupled to said microprocessor means, means for sending said weight signals to said processing unit, a rotational speed reading device associated with each blower and the rotary sieve for providing a speed signal input to respective rotation control circuits in said unit, a motor controller connected to each motor, each of said rotational control circuits providing an input signal to a respective motor controller via said processing unit to control the speed of the respective motor and associated blower to maintain a desired air velocity int he respective densimetric separator column.

5,181,617

METHOD AND APPARATUS FOR SEPARATING AT LEAST A FRACTION FROM A MIXTURE CONTAINING RECLAIMABLE MATERIALS

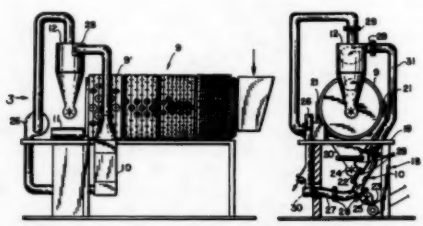
Falko Lehrmann, Tönisvorst, Fed. Rep. of Germany, assignor to Buehler AG, Uzwil, Switzerland

Continuation-in-part of Ser. No. 545,771, Jun. 28, 1990, abandoned, which is a continuation of Ser. No. 301,556, Jan. 23, 1989, abandoned. This application Sep. 24, 1990, Ser. No. 587,343

Claims priority, application Switzerland, Jan. 22, 1988, 00218/83

Int. Cl.[5] B07B *9/00*

U.S. Cl. 209—31 **11 Claims**



1. An apparatus for separating a mature, composed biorefuse mixture having a biological compost fraction and a plastic waste fraction, comprising:

(a) a drum sieve having an inlet end, an outlet end, an outside surface, and sieving holes through said outside surface;

(b) feeding means for delivering the mixture into said drum sieve;

(c) sifting means comprising:

(i) an inlet for receiving material sieved through said drum sieve, said inlet being connected to said outside surface;

(ii) a first outlet for dispensing a light fraction; and,

(iii) a second outlet for dispensing a heavy fraction;

means for providing an isolated gas stream within said sifting means, said gas stream causing said light fraction to be directed to said first outlet;

(v) ducts for interconnecting said inlet, said first and second outlets, and said means for providing an isolated gas stream, said ducts providing a pathway for said gas stream; and,

(e) locking means for containing said gas stream within said ducts and preventing said stream from entering said drum sieve, said locking means located within said inlet of said sifting means.

5,181,618

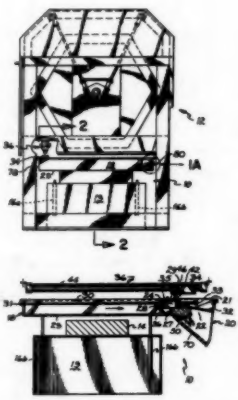
APPARATUS FOR CLEARING THE WEIGH PAN OF A PARTICLE SIZE ANALYZER

Glenn J. Pogue, Cincinnati, Ohio, assignor to Rotex, Inc., Cincinnati, Ohio

Filed Jun. 26, 1991, Ser. No. 721,181

Int. Cl.[5] B07B *13/14*

U.S. Cl. 209—239 **16 Claims**



1. Apparatus for clearing the weigh pan of a particle size analyzer, comprising:

a pan for receiving a sample of particulate matter, said pan including a discharge outlet through which the particulate sample can be discharged;

wiper means for moving the particulate sample out through said discharge outlet;

means for driving said wiper means to so move the particulate sample from said pan; and

means for raising and lowering said pan to engage and disengage said drive means.

5,181,619

APPARATUS AND SYSTEM FOR STORING AND COLLECTING SEPARATED SOLID WASTE

John W. Noble, 1742 Tanglewood Dr., NE., St. Petersburg, Fla. 33702

Filed Jan. 24, 1991, Ser. No. 645,095

Int. Cl.[5] B07C *7/04*

U.S. Cl. 209—702 **12 Claims**

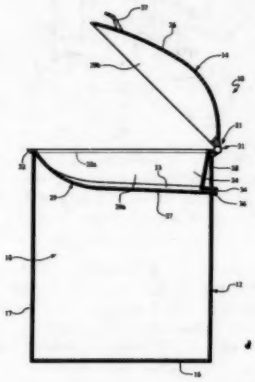
1. A chambered container for storing separated, solid waste comprising:

a container body defining a first chamber therein for receiving a first solid waste; and

a lid for covering said container body, said lid being connected to said container body and being movable between a first, closed position closing said first chamber, and a second, open position providing access to said first chamber, and including a flange for seating on an upper edge of

said container body to fully close said first chamber when said lid is in said first, closed position,

said lid including a base portion for defining a second chamber therein for receiving a second solid waste, said base portion extending into said first chamber when said lid is in said first, closed position, and a cover for covering said



base portion, said cover being connected to said base portion and being movable between a first, closed state for closing said second chamber and a second, open state for providing access to said second chamber, said cover seating on said flange to fully close said second chamber when said cover is in said first, closed state.

5,181,620

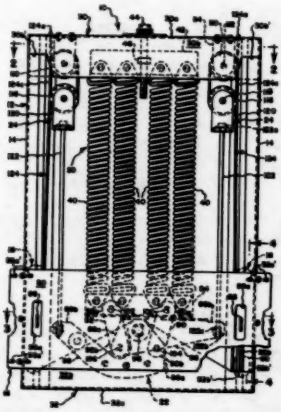
COUNTERBALANCE MECHANISM

Richard L. Watt, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed Jun. 4, 1991, Ser. No. 710,105

Int. Cl.[5] A47F *5/00*

U.S. Cl. 211—59.3 **9 Claims**



1. A counterbalance mechanism for supporting a shelf for vertical movement, said mechanism comprising in combination:

a frame including a pair of vertically extending guide tracks;

shelf support means including a pair of followers movable along said pair of guides;

counterbalance spring means having a first end connected to said frame and a second end;

a pair of coupling means having first ends connected to said shelf support means and second ends; and

a linkage assembly having one end connected to said second end of said spring means and a second end, said second end of said linkage assembly including first and second force transmitting arms connected one to each of said second ends of said pair of coupling means, and said linkage assembly being operable for causing said first ends of said coupling to move through a uniform distance as a result of movement of said second end of said spring means and through a distance which exceeds said distance which said second end of said spring means is moved.

5,181,621

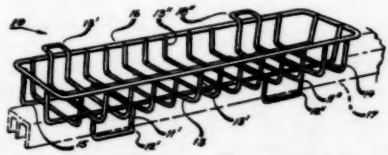
TUB-SHOWER HEADER-BAR ACCESSORY-RACK W/UNIVERSAL-BRACKET

Jay L. Plaehn, 1765 (#68) Garnett Ave., San Diego, Calif. 92109

Filed May 15, 1991, Ser. No. 700,585

Int. Cl.[5] A47F *5/14*

U.S. Cl. 211—181 **4 Claims**



1. A universally adaptable convenience accessory rack for mounting atop an existing headerbar fixture, comprising: a substantially rigid wire tray having a substantially vertical perimeter side wall integral with and surrounding a horizontal bottom portion; including at least one fixed bifurcated wire leg like mounting bracket formed thereunder in a downwardly projecting manner, each said bifurcated leg like mounting bracket comprising a horizontal base and legs extending angularly downward therefrom, said base comprising U-shaped elements having sides and a bight portion, said sides being integral at the top thereof with respective ends of said base members, said bracket having manually bendable adjustability means, which when adjusted to a spaced gap interval slightly smaller than the width of the headerbar, is capable of imposing a substantial opposed clamping action for stable retention atop said existing supporting headerbar.

5,181,622

SEISMIC SHELF GUARD

Bjarki H. Hallgrimsson, Mountain View, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 626,899, Dec. 13, 1990, Pat. No. 5,119,948. This application May 22, 1992, Ser. No. 887,638

Int. Cl.[5] A47F *7/00*

U.S. Cl. 211—183 **14 Claims**

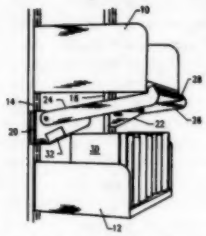
1. A guard for a shelf comprising

at least one stationary support bracket,

at least one linkage pivotally attached to said support bracket, and

a retention bar extending from said linkage across the front of a shelf,

said linkage and retention bar being pivotable to a raised position thereby permitting access to said shelf and being



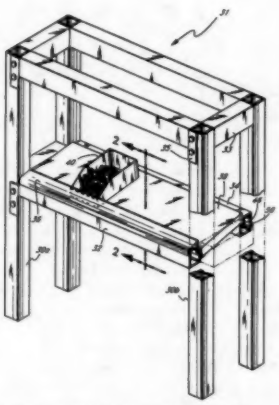
pivotable to lowered position for preventing items from falling from said shelf.

5,181,623

DISPLAY SHELF ADAPTER

Tom H. Linden, Yorba Linda; Dick Passaglia, and Ray Taccolini, both of Villa Park, all of Calif., assignors to Crown Bolt, Inc., Cerritos, Calif.

Filed Dec. 17, 1991, Ser. No. 809,051
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—183 **13 Claims**



1. A shelf adaptor which is sized to fit on a notched shelf support and which supports one end of a shelf at an elevation lower than said notched shelf support, comprising:

a bracket portion which is sized to fit upon the upper end of said shelf support; and

a shelf supporting portion joined to said bracket portion which is at a lower elevation than said shelf support member.

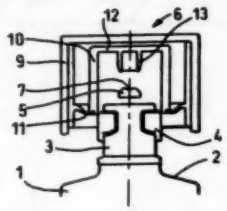
5,181,624

DEVICE FOR CLOSING FLASKS

Robert Petit, Chevilly-Larue, France, assignor to Lir France (S.A.), Chevilly-Larue, France

Filed Nov. 19, 1991, Ser. No. 797,804
Claims priority, application France, Dec. 3, 1990, 90 15107
Int. Cl.[5] B65D *55/02, 41/06*
U.S. Cl. 215—330 **8 Claims**

1. A device for closing a flask having a neck with a closing cap cooperating with said neck, said device comprising two diametrically opposed open ramps separated by passages therebetween and provided on the neck of the flask, each ramp having in its center an axially extending projection, said closing cap including a cylindrical skirt formed inside with two latching studs diametrically opposite and each carrying a housing which cooperates with one of said projections, said flask being closable by axially downwardly driving said closing cap



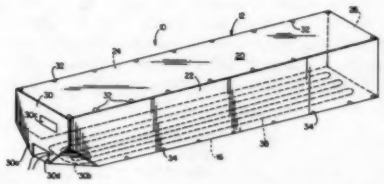
in the same direction as said projections when the latching studs are in register with the passages between the ramps, said cap being rotatable in either direction of rotation to secure either projection with either housing.

5,181,625

LINER FOR A CARGO CONTAINER

Victor T. Podd, Sr.; Victor I. Podd, Jr., and Stephen D. Podd, all of 255 Beverly Avenue, Montreal, Quebec, Canada

Filed Feb. 15, 1990, Ser. No. 482,030
Int. Cl.[5] B65D *87/00*
U.S. Cl. 220—1.5 **16 Claims**



1. A liner for a cargo container defining an interior cargo space, a liner comprising a flexible and expandable body adapted to fit inside the cargo space and defining an interior to hold a bulk cargo, the expandable body including at least first and second adjacent panels forming an edge, a multitude of reinforcing members and a multitude of connecting segments located adjacent said edge;

each connecting segment comprising a multitude of layers located one on top of another over a respective one given area, said given area defining a perimeter of the connecting segment;

the layers of the connecting segment forming at least one through opening spaced from said perimeter and extending through said layers to help secure the liner to the cargo container; and

the multitude of layers of each connecting segment including

i) a first layer comprising a first section of a respective one of the reinforcing members,

ii) a second layer comprising a respective one portion of the first panel,

iii) a third layer comprising a respective one portion of the second panel, and

iv) a fourth layer comprising a second section of the respective one of the reinforcing member; and

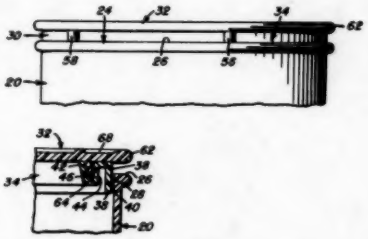
the multitude of layers of each connecting segment being bonded together completely over the respective given area of the connecting segment to maintain the interior of the liner and a bulk cargo therein sealed from tears that develop in the connecting segment and extending outward from the through opening in the connecting segment to said edge of the liner.

5,181,626

CLOSURE ASSEMBLY FOR CONTAINERS

Robert H. C. M. Daenen, Erembodegem, Belgium; Stig Lillelund, Gentofte, Denmark; Masao Kato, Okazaki, Japan; Peter Lonergan, Central, Hong Kong, and Augusto A. Picozza, Orlando, Fla., assignors to Dart Industries, Inc., Deerfield, Ill.

Filed Mar. 28, 1991, Ser. No. 677,017
Int. Cl.[5] B65D *43/04, 51/18*
U.S. Cl. 220—282 **25 Claims**



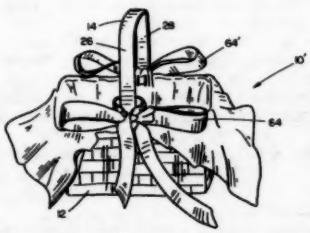
1. A closure assembly for a container mouth; said closure assembly comprising a seal member of flexibly resilient material, said seal member having an outer periphery including means for sealing said seal member to the container mouth, a separately formed rigid lid, means for sealing said lid to said seal member in overlying relation thereto and comprising an upwardly directed sealing groove formed within said seal member and spaced inward of said outer periphery thereof and a depending flange integral with said lid and received within said sealing groove, and fulcrum means on said closure assembly below said overlying lid and outward of said outer periphery of said seal member for rocking movement of said lid thereabout between a first closed position to generally parallel and seal the container mouth, and an open position wherein a portion of the lid is upwardly pivoted relative to and away from said closed position, said seal member being fixed to said lid for movement of said seal member with said lid between said closed and open positions said lid and seal member together defining removable closure means for repeated and routine opening and closing of the container mouth.

5,181,627

BASKET LINER

Susan M. McDermott, 12216 Izard St., Omaha, Nebr. 68154, and Mary J. Ellis, 1405 North 127th Cir., Omaha, Nebr. 68154

Continuation-in-part of Ser. No. 690,109, Apr. 23, 1991, Pat. No. 5,097,979. This application Feb. 26, 1992, Ser. No. 842,217
The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—404 **7 Claims**



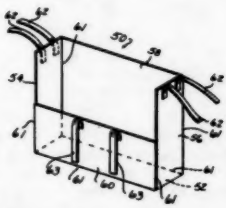
1. In combination:
a basket having front and rear upstanding panels, opposing upstanding first and second side panels, a bottom, and a handle having a front leg projecting upward from said front panel and a second leg projecting upward from said rear panel;
said front leg having an inward face, an opposing outward face, and opposing right and left sides,
said second leg having an inward face, an opposing outward face, and opposing right and left sides,
a basket liner connected to said basket handle, comprising:
a sheet of fabric having front and rear edges, opposing first and second side edges, an upper surface and a lower surface;
first means adjacent the front edge of said sheet for connecting said sheet to said first leg of said handle;
said first connecting means including a portion of said front edge of said sheet wrapped around said first leg with a right portion extending outwardly around the right side of the front leg and a left portion extending outwardly around the left side of the front leg, and first fastener means for connecting the right and left portions of the wrapped portion of the front edge together adjacent the outward face of the front leg;
second means adjacent to the rear edge of said sheet for connecting said sheet to said second leg of said handle; and
said second connecting means including a portion of said rear edge of said sheet wrapped around said second leg with a right portion extending outwardly around the right side of the second leg and a left portion extending outwardly around the left side of the second leg, and second fastener means for connecting the right and left portions of the wrapped portion of the rear edge together adjacent the outward face of the second leg.

5,181,628

WASTE RECEPTACLE LINER BAG

Alozie C. Okezie, 624 Packard, Apt. #2, Ann Arbor, Mich. 48104

Filed Feb. 5, 1992, Ser. No. 831,407
Int. Cl.[5] B65D *25/16, 30/10, 33/14*
U.S. Cl. 220—404 **4 Claims**



1. In a waste receptacle having a bottom wall, opposed side walls joined to and extending upward from the bottom wall to a top end, a back wall joined to the side walls and the bottom wall and extending upward from the bottom wall to a top end, the back wall and the side walls having identical lengths such that the top ends thereof surround an open top end in the waste receptacle, and a short front wall joined to and extending from the bottom wall to an upper edge intermediate the length of the side walls, the front wall having a height shorter than the height of the side walls to define an access opening in combination with an upper portion of the side walls extending above the upper edge of the front wall into the interior of the waste receptacle, the access opening continuing to the open top end of the waste receptacle, the improvement comprising:
a liner bag in the form of a unitary, flexible container having a bottom wall, a back wall, and opposed side walls, the back wall and the side walls having identical lengths and extending from one end in registry with the bottom wall to opposed spaced, second ends surrounding an open top

end of the liner bag, a front wall extending from the bottom wall to an upper end intermediate the length of the side walls to define an opening into the interior of the container between the upper end of the front wall, the portions of the side walls extending upward from the upper edge of the front wall, and the open top end coincident with the access opening and the open top end in the receptacle when the liner bag is mounted in the receptacle;

a plurality of straps attached to at least certain of the side walls and the back wall of the container, for supporting the container in the receptacle and for assisting in the removal of the container from the receptacle; and wherein the bottom wall, the front wall, the back wall and at least one of the side walls of the container are disposed in substantial registry with and cover the bottom wall, the front wall, the back wall and at least one of the opposed side walls, respectively, of the waste receptacle when the liner bag is mounted in the waste receptacle.

5,181,629

COMBINATION MIXER DISPENSER

James O. Camm, 51 Millewa Ave., Chadstone Victoria, and Stephen J. Camm, 11 Kaisman Sq., Wantirna Victoria, both of Australia

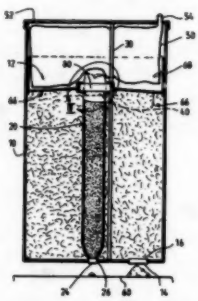
Continuation of Ser. No. 534,468, Jun. 7, 1990, Pat. No. 5,050,774. This application Jun. 21, 1991, Ser. No. 718,994

Claims priority, application Australia, Jun. 13, 1989, PJ4700

The portion of the term of this patent subsequent to Sep. 24, 2008, has been disclaimed.

Int. Cl.[5] B67D *5/00*

U.S. Cl. 222—80 **5 Claims**



1. A dispenser for dispensing two components, said dispenser comprising a first container for containing one of the components and a second container for containing a second of the components, said first container having a first piston for movement int he first container for forcing the first component out of the first container, and said second container having a second piston for forcing the second component out of the second container, said dispenser further including a second piston moving means, including a cutting means fixed relative to the first piston for cutting said second container as the first piston is moved, for moving said second piston relative to said second container when said first piston is moved to thereby cause movement of the first piston and the second piston in a fixed manner relative to one another to dispense a predetermined amount of the first component and second component from the first and second containers respectively, and for providing that cutting of the second container by the cutting means enables movement of the first piston, the second piston moving means and the second piston relative to the first container and the second container, said second piston moving means comprising a blade extending across said second container and mounted above said second piston such that, upon movement of the first piston, the blade slices he second container and a portion of the blade abuts the second piston and pushes the second piston to cause the second piston to move with the first piston relative to the second container.

5,181,630

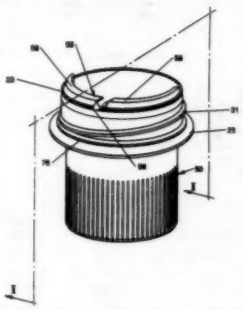
VESSEL HAVING DUAL FUNCTION POURING SPOUT FOR SPOT TREATING OR RAPID TRANSFER OF VISCOUS LIQUIDS

Mark P. McNally, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 19, 1991, Ser. No. 717,455

Int. Cl.[5] B67D *1/16*

U.S. Cl. 222—109 **22 Claims**



1. In a vessel for dispensing liquid, the improvement wherein said vessel includes an outwardly directed pouring spout portion for dispensing small quantities of said liquid from said vessel in a concentrated stream without contaminating the exterior surfaces of said vessel, said pouring spout portion including a pair of opposed edges, said vessel further including a pair of opposed dams extending from said opposed edges of said outwardly directed pouring spout portion to initially prevent the escape of liquid from within said vessel, each of said dams having an upper most surface defined by an innermost edge and an outermost edge, said innermost edges of said dams being at a lower elevation that said outermost edges of said dams so that any liquid remaining on said uppermost surfaces of said dams is caused in drain back into said vessel when said vessel is returned to an upright position, whereby small quantities of said liquid can be slowly dispensed through only said first outwardly directed pouring spout portion and large quantities of said liquid can be rapidly dispensed by further tilting said vessel so that said liquid will be dispensed not only through said directed pouring spout portion, but also over said dams without contaminating the exterior surfaces of said vessel.

5,181,631

BEVERAGE DISPENSER VALVE WITH CONTROLLABLE FLOW RATE

William S. Credle, Jr., Stone Mountain, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 261,876, Oct. 24, 1988, Pat. No. 4,966,306, which is a continuation-in-part of Ser. No. 888,546, Jul. 18, 1986, abandoned, and a continuation-in-part of Ser. No. 24,933, Mar. 12, 1987, Pat. No. 4,779,761, which is a continuation-in-part of Ser. No. 925,426, Oct. 31, 1986, abandoned. This application Oct. 26, 1990, Ser. No. 604,698

The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.

Int. Cl.[5] B67D *5/56*

U.S. Cl. 222—129.2 **4 Claims**

1. A beverage dispensing valve for mixing together a quantity of water and concentrate and for dispensing the mixture therefrom comprising:

(a) a dispensing valve body including first and second liquid passageways extending therethrough, said first passageway being for water and said second passageway being for concentrate;
(b) a nozzle connected to said body and including means for mixing water and concentrate together and for dispensing the mixture therefrom;
(c) means for controlling the ratio of water to concentrate fed to said nozzle;

(d) first valve means for controlling the flow through said first passageway;
(e) second valve means for controlling flow through said second passageway;
(f) a switch for starting and stopping the dispense function of said beverage dispensing valve; and
(g) means for varying the total flow rate of beverage from said nozzle while said beverage dispensing valve maintains a constant ratio of water to concentrate.

5,181,632

DISPENSER CAP HAVING TAMPER-EVIDENT FEATURES

David L. Latter, Glendale, Calif., assignor to Morehouse Foods, Inc., Los Angeles, Calif.

Filed Aug. 15, 1991, Ser. No. 745,553
Int. Cl.[5] B67B *5/00*
U.S. Cl. 222—153 **17 Claims**

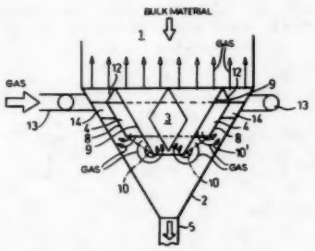
1. A dispenser cap adapted for tamper-proof sealing to a container, comprising:
a spout portion having an annular flange defining a series of spaced-apart, ridged circular segments on an outer periphery at a first end, said flange extending away from and surrounding a central tip, having a second end with a first opening therein communicating with a central passage terminating in a second opening in said first end, said passage having an internal wall with means thereon for altering a relative position of said spout portion with respect to a screw-on container cap; said screw-on container cap having internal threads to match external threads on a container neck, said container cap having, on an upper surface thereof, an intention complementary in shape to said flange and surrounding a central column portion having a shape to cooperate with said means for altering said relative position, said container having an outer peripheral cylindrical surface comprising a plurality of spaced parallel ridges, said column means terminating in a plug means for occluding said first opening in said second end of said spout portion when said spout portion and said container cap are in a fist relative configuration, and orifice means proximally adjacent said plug means, said orifice means for allowing a clear passage from a central hollow interior of aid column portion through said opening in said second send of said spout potion when aid spout portion and said container cap are in a second relative configuration.

5,181,633

CONTAINER FOR BULK MATERIAL WITH DISCHARGE CHUTE

Raymond Weber, Witten, and Wolfgang Wünnenberg, Essen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

PCT No. PCT/EP90/00179, § 371 Date Jun. 21, 1991, § 102(e) Date Jun. 21, 1991, PCT Pub. No. WO90/08712, PCT Pub. Date Aug. 9, 1990
PCT Filed Feb. 1, 1990, Ser. No. 691,055
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1989, 8901136[U]
Int. Cl.[5] B65G *69/06*
U.S. Cl. 222—195 **11 Claims**



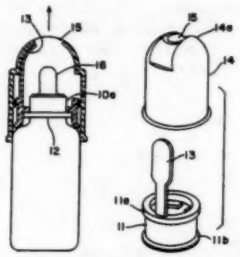
1. A container for bulk material comprising:
a container body;
a discharge chute extending downwardly from said body along an upright axis and formed with a peripheral wall and bottom means forming an exit for the bulk material;
a tapered distribution body centered on said axis in said chute;
a hollow glide body centered on said axis in said chute and surrounding said distribution body, said glide body comprising:
an inner wall spaced from said distribution body and formed with a bottom edge defining an outlet opening spaced axially upwardly from said exit,
outer walls at least partially surrounding said inner wall, and
a top wall bridging said inner and outer walls, said peripheral, inner, and outer walls being spaced from one another and being generally parallel to one another, said outer walls terminating at a distance above said bottom edge of said inner wall; and
fastening means for mounting said distribution body and said hollow glide body on said chute.

5,181,634

RECESSED TIP FLUID DISPENSER

Kenneth J. Gibilisco, Coopersburg, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 18, 1991, Ser. No. 761,522
Int. Cl.[5] B65D *37/00*; B67D *3/00*
U.S. Cl. 222—212 **7 Claims**



1. A container for storing and dispensing a liquid comprising:

a body having a neck, a transfer bead formed on said neck, a dispensing tip formed on the top of said neck and having a longitudinal axis;

an inner member being connected to said body on said transfer bead and having a flexible shield member vertically projecting from the top of said inner member; and

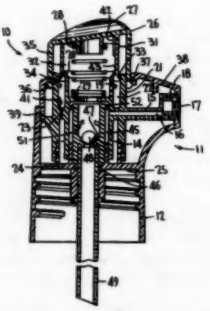
an actuating cap for protecting said dispensing tip being connected to said inner member and having an aperture coaxially aligned with said longitudinal axis, said actuating cap being longitudinally movable along said inner member between a lower closed position wherein said flexible shield member flexes to cover said aperture and conceal said dispensing tip and an upper raised position wherein said flexible shield member slides away from said aperture to expose said dispensing tip.

5,181,635

LIQUID PUMP DISPENSER HAVING A STATIONARY SPOUT

Mark A. Balderrama, Colton, and R. P. Grogan, Downey, both of Calif., assignors to Calmar Inc., Industry, Calif.

Filed May 31, 1991, Ser. No. 708,377
Int. Cl.[5] B65D *5/40*
U.S. Cl. 222—383 **7 Claims**



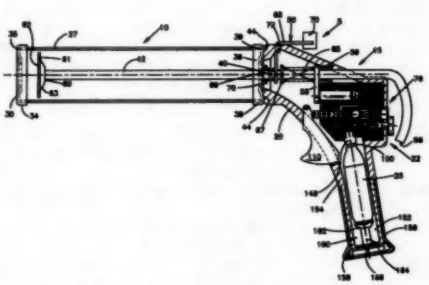
1. A liquid pump dispenser comprising, a pump body mountable in a fluid tight manner on a container of flowable product to be dispensed, an upstanding stationary pump piston on said body, a valve controlled inlet within said body, a manually reciprocable spring biased plunger head having a plunger skirt in sealing engagement with said piston for therewith defining a variable volume pump chamber, a stationary spout on said pump body defining a discharge passage extending from said pump chamber, a discharge valve acting between said pump chamber and said discharge passage, an annular sleeve on said body surrounding said piston in spaced relationship and therewith defining a vent chamber openable to the atmosphere, said body having means defining a vent passage extending from said vent chamber into the container, an annular vent seal on said plunger skirt in sealing engagement with an inner wall of said sleeve for sealing said vent chamber closed in an upper position of said plunger head relative to said piston, and means on said inner wall for breaking the sealing engagement between said vent seal and said inner wall in a lowered position of said plunger head relative to said piston for venting the interior of the container to atmosphere.

5,181,636

INCREMENTAL DISPENSING DEVICE

J. Edward C. Anderson, Moreland Hills, and James R. Jeromson, Jr., Aurora, both of Ohio, assignors to Milbar Corporation, Chagrin Falls, Ohio

Filed Dec. 14, 1990, Ser. No. 627,845
Int. Cl.[5] B67D *5/42*
U.S. Cl. 222—389 **27 Claims**



20. A fluid operated dispensing device, comprising:

receiving means adapted to receive and dispense a viscous product;

a drive means comprising a drive piston and a push rod disposed at least partially within the receiving means and adapted to urge the viscous product from the receiving means;

an actuating chamber;

an actuating piston adapted to reciprocate between an initial position and an extended position within said actuating chamber, said actuating piston having means in contact with said push rod to incrementally move said drive piston and said push rod within said receiving means, said means in contact with said push rod including a washer located around said push rod and adapted to be drive off center and against said push rod by said activating piston;

biasing means normally biasing said actuating piston to its initial position, said biasing means including a spring located around said push rod in contact with said washer and adapted to bias said washer and said actuating piston into said initial positions;

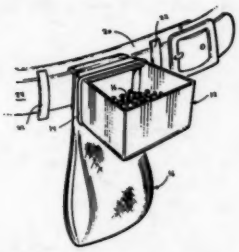
means for selectively supplying fluid to a portion of the actuating chamber to increase the pressure within the chamber and drive the actuating piston against its bias from its initial position to its extended position, and means to selectively exhaust said fluid from said portion of the actuating chamber to allow said actuating piston to return from its extended position to its initial position, whereby each activation of said actuating piston incrementally moves said drive means.

5,181,637

COMBINATION NAIL BAG AND OPEN TOP CONTAINER

Joseph Santilli, 1221 Frontage Rd., Chula Vista, Calif. 92011

Filed May 6, 1991, Ser. No. 700,217
Int. Cl.[5] B65D *83/00*; A45F *5/00*
U.S. Cl. 224—196 **4 Claims**



1. A combination nail bag and open top container comprising:

a nail bag having a closed bottom end and an open top end having a lip that extends around said open top end, said nail bag having a front surface and a rear surface;

an open top container having a front end and a rear end, said container having a bottom wall, a front wall and laterally spaced side walls, the rear end of said container having an opening;

means for detachably connecting the open top end of said nail bag over the opening in the rear end of said open top container; and

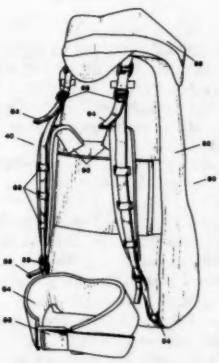
a clip assembly on one of the walls of the open top container for detachably attaching said combination structure to the belt of a carpet layer.

5,181,638

BACKPACK WITH INDEPENDENTLY ADJUSTABLE STABILIZING STRAPS AND SHOULDER PADS

Daniel M. McHale, 3431 12th Ave. W., Seattle, Wash. 98119

Filed Dec. 9, 1991, Ser. No. 806,101
Int. Cl.[5] A45F *3/04*
U.S. Cl. 224—215 **8 Claims**



8. A strap assembly for carrying an article upon a person's shoulders comprising:

a pair of shoulder pads attached at a first end to the article and attached at a second end to a pair of first adjustment buckles, respectively;

a pair of shoulder pad adjustment straps threaded through said first adjustment buckles and anchored at one end, thereof, to the article;

a pair of second adjustment buckles attached at one end to the article;

a pair of stabilizing straps threaded through said pair of second buckles, respectively, said stabilizing straps anchored at one end, thereof, to the article;

means to allow said stabilizing straps to slide freely relative to said shoulder pads;

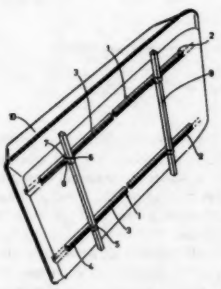
wherein, said means to allow said stabilizing straps to slide freely provides for independent adjustability of said stabilizing straps and said shoulder pads.

5,181,639

SKI BOX ATTACHMENT

Klas-Göran Kvänna, Mora, Sweden, assignor to AB Formplast, Sweden

PCT No. PCT/SE90/00140, § 371 Date Aug. 30, 1991, § 102(e) Date Aug. 30, 1991, PCT Pub. No. WO90/10556, PCT Pub. Date Sep. 20, 1990
PCT Filed Mar. 2, 1990, Ser. No. 761,361
Claims priority, application Sweden, Mar. 7, 1989, 8900798
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—328 **16 Claims**



1. Apparatus for attaching a ski-box (10) to a roof-rack, having at least one longitudinal adjustment rail (1) for attachment to the bottom of a ski-box (10), in a longitudinal direction of the ski-box, and having at least one load carrier clamp (5) being displaceable longitudinally along the at least one longitudinal adjustment rail and being securable thereto for adjustably and securably receiving a load carrier member (9) of a roof-rack, said at least one longitudinal adjustment rail (1) being provided with a longitudinal groove (4) in which the at least one load carrier clamp (5) is displaceably guided and the at least one load carrier clamp (5) being formed of a U-shaped portion (6) for receiving the load carrier member (9) of the roof-rack and two mounting flanges (7) extended at a right angle outwardly from an end of a respective leg of the U-shaped portion (6), wherein at least one longitudinal adjustment rail (1) is provided with two displaceable and securable load carrier clamps (5) for adjustably and securably receiving front and rear load carrier members (9) respectively of the roof-rack, in that the load carrier clamps (5) are attached to the at least one longitudinal adjustment rail (1) by means of bolts (8) received in bores (14) of the mounting flanges (7) and extended into the longitudinal groove (4) of the at least one longitudinal adjustment rail (1) and engaged by nuts (13) displaceably provided within the at least one longitudinal adjustment rail (1), and in that internal depth (d) of the U-shaped portion (6) of the load carrier clamp (5) is smaller than external height (h) of the load carrier member (9), whereby a tightening of the bolts (8) of the respective load carrier clamp (5) causes on the one hand a clamping of the load carrier clamp (5) against the at least one longitudinal adjustment rail (1) and, on the other hand, a clamping of the load carrying member (9)

between the load carrier clamp (5) and the at least one longitudinal adjustment rail (1).

5,181,640

APPARATUS FOR REMOVING BREAK-OUT PORTIONS FROM A SHEET OF MATERIAL OR THE LIKE

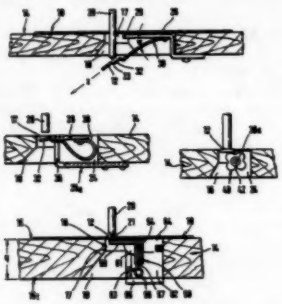
Franz Vossen, and Karl-Anton Stoppel, both of Stockach-Wahlwies, Fed. Rep. of Germany, assignors to Meurer Nonfood Product GmbH, Radolfzell, Fed. Rep. of Germany

Filed Mar. 11, 1991, Ser. No. 667,448

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1990, 9003017[U]

Int. Cl.[5] B26D *7/18*; B26F *1/40*

U.S. Cl. 225—93 **18 Claims**



1. Apparatus for removing break-out portions from a sheet of material, which comprises: a break-out surface having an aperture therein; a sheet of material containing a break-out portion, said sheet resting on the break-out surface so that the break-out portion extends over said aperture; a break-out member operative to press downwardly through said aperture and press said break-out portion downwardly through said aperture; a support surface associated with said break-out member to support said break-out portion, said support surface being guided in the direction of movement of the break-out member, wherein said support surface is movable within the aperture at least partially into a position at a spacing relative to the break-out surface and which in its rest position is located substantially parallel to and beneath the break-out portion in the sheet of material and which is adapted to be transferred into an inclined position relative to the sheet of material upon movement of the break-out portion by said break-out member upon downward movement of the break-out portion, and wherein said support surface is part of an element which is rotatable about an axis against a force storage means into said inclined position, wherein the force storage means produces a return force against said element.

5,181,641

TRACTOR FEED FOR PERFORATED WEBS

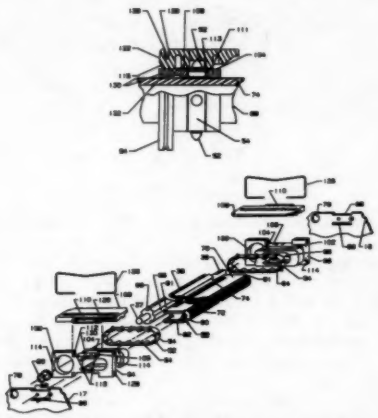
Gregory A. Ferguson, 3146 Acushnet Ave., New Bedford, Mass. 02745

Filed Sep. 17, 1991, Ser. No. 762,815

Int. Cl.[5] B65H *20/20*

U.S. Cl. 226—74 **11 Claims**

1. A unitary tractor feed mechanism for feeding a web in a direction length-wise thereof, said web having two rows of perforations in the length-wise direction spaced from each other width-wise of the web, said mechanism comprising a pair of endless belts with pins spaced to enter said perforations and drive elements, said pins and drive elements respectively projecting outwardly and inwardly from opposite sides of said belts, a single element consisting of a bar having a surface providing a support platform for said drive elements and extending in a width-wise direction a distance at least equal to the width of the web, a sprocket having teeth spaced peripherally thereof between which slots for receiving said drive elements are disposed also spaced peripherally about said sprocket between said teeth thereon, said sprocket also extending in the width-wise direction, said sprocket and said bar being disposed within the insides of said belts with said drive elements received in said slots and also bearing on said support platform of said bar, a pair of web and belt guide members adjustably spaced from each other width-wise of said web and disposed



on said bar, said members having slots therein extending in a direction length-wise of said web in which slots said belts are located with said drive elements on said support platform of said bar, said slots extending inwardly from surfaces of said members on which said web is disposed with said pins extending outwardly into said perforations, said surfaces of said members thereby guiding said web at a distance spaced vertically from said support platform of said bar with said pins extending outwardly into said perforations.

5,181,642

PRESS FEED APPARATUS INCLUDING A LINKAGE MECHANISM HAVING A THREE-LINK ASSEMBLY FOR USE IN ROTATING STOCK MATERIAL FEED ROLLS

Joseph P. Gentile, Pittsburgh, and Vaughn H. Martin, Aspinwall, both of Pa., assignors to Vamco Machine & Tool, Inc., Pittsburgh, Pa.

Filed May 3, 1991, Ser. No. 695,499

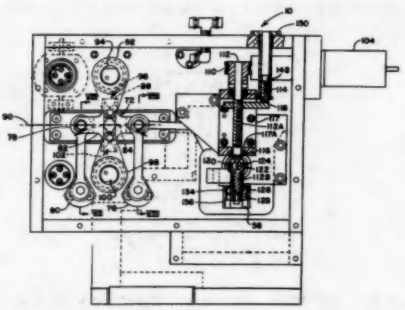
Int. Cl.[5] B65H *20/18*

U.S. Cl. 226—137 **8 Claims**

1. In a press feed having feed means shafts and means for driving the feed means shafts, the improvement comprising:

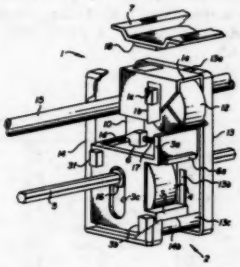
a linkage mechanism connecting the feed means shafts to the means for driving same, the linkage mechanism including a three-link assembly having first and second links substantially parallel and a third cross link pivotally connected to the first and second links, with the first and second links pivotally mounted to a housing of the press feed substantially equidistant from the connections to the third cross link; the third cross link having a groove extending substantially at right angles to the transverse axis of the third cross link extending between the connections to the first and second links; and first and second slides positioned in the groove in the third cross link and each

connected to swing arms drivingly connected to the feed means shafts such that upon operation of the press feed the



third cross link moves through an arc defined by a preselected feed length to be fed by the press feed to a press.

5,181,643
SHEET-STAPLING DEVICE
Manfred Radtke, Korb, Fed. Rep. of Germany, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 21, 1991, Ser. No. 779,771
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1990, 4035869
Int. Cl.[5] B27F *7/30*
U.S. Cl. 227—110 **4 Claims**



1. Stapling device for connecting sheets arranged in a stack by means of staples, said device comprising:

a housing (13, 14); means for mounting said housing for movement to a plurality of selectable stapling positions; a driving element and a stapling head actuatable by said driving element located in said housing, said stapling head (1) including at least one entrainment member (1*d*) extending therefrom; means (6) for releasably coupling said stapling head (1) and said driving element (2) to enable said stapling head to be readily removed and replaced, said coupling means including a coupling slider (6) supported on said driving element (2), at least one spring for urging said coupling slider (6) for movement on said driving element (2) into engagement with said at least one entrainment member (1*d*); and means within said housing for guiding said coupled stapling head (1) and said driving element (2) for shifting movement in a direction to effect stapling, said coupling means (6) being movable transversely to such direction of shifting movement.

5,181,644
NAIL DRIVER
Landon W. Ferrell, 1921 Pleasant View La., Knoxville, Tenn. 37914
Filed Jan. 13, 1992, Ser. No. 819,804
Int. Cl.[5] B25C *1/02*
U.S. Cl. 227—147 **6 Claims**

1. A nail driver comprising:

an elongated tubular barrel having a nail accepting forward end and an opposite rear end, said barrel provided with a cylindrical bore having an internal diameter adapted to accept a nail and its head,

said barrel having a collar adjacent said rear end, said collar provided with an axial bore of less diameter than said barrel bore,

a cylindrical rod having a diameter less than said collar bore and allowing for sliding passage of said rod therethrough,

said rod having a forward end presenting a diameter greater than said rod diameter and less than said barrel bore diameter, said rod including a rear end axially disposed rearwardly of said barrel collar,

a strike head on said rod rearward end and having a diameter greater than said rod diameter, said strike head including a forward face directed toward said barrel collar, and

cooperating thread means on said rod rearward end and on said strike head for controlling the depth a nail is driven into a workpiece and for removably attaching together said rod rearward end and said strike head, such that upon relative rotation of said cooperating threads, said strike head is caused to be axially adjusted with respect to said rod rearward end, thus to vary the axial distance between said strike head front face and said rod forward end, whereby said axial distance may be adjusted to vary the amount any nail is driven into a workpiece,

there being at least a pair of said strike heads of different overall axial length dimension, and otherwise being of substantially identical configuration, selectively threaded onto said rod rearward end, thus to vary the said axial distance between said strike head front face and said rod forward end, whereby said axial distance may be adjusted to vary the amount any nail is driven into a workpiece.

5,181,645
MEDICAL STAPLER
Kanji Matsutani, Takanezawa; Masatoshi Fukuda, Utsunomiya, and Katsutoshi Sato, Kamikawachi, all of Japan, assignors to Matsutani Seisakusho Co., Ltd., Tochigi, Japan
Filed Jan. 22, 1992, Ser. No. 824,152
Claims priority, application Japan, Jan. 24, 1991, 3-22702
Int. Cl.[5] A61B *17/068*
U.S. Cl. 227—177 **3 Claims**

1. A medical stapler comprising:

(a) a casing having an opening;

(b) first guide means for guiding a ram provided within said casing and extending generally linearly;

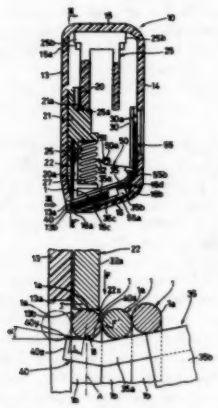
(c) a ram supported on said first guide means for sliding movement therealong, said ram having first shaping surfaces disposed in opposed relation to an anvil;

(d) an operating member mounted on said casing so as to advance said ram;

(e) second guide means for guiding staples provided within said casing and extending in a direction intersecting a path of movement of said ram, a plurality of staples being slidably supported on said second guide means and arranged in contiguous relation to one another in a direction

of a length of said second guide means, and each of said staples having a crown portion, and a pair of legs extending angularly from opposite ends of said crown portion, respectively;

(f) said anvil extending from a distal end of said second guide means, said anvil being disposed in the vicinity of said opening of said casing and disposed in the path of movement of said ram, said anvil having a second shaping surface disposed in opposed relation to said ram, said second shaping surface having a distal end in the direction of the end of said second guide means, and said second shaping surface being inclined relative to the path of movement of said ram so that a distance in a direction of the path of movement of said ram between said first and



second shaping surfaces progressively decreases toward said distal end of said second shaping surface;

(g) urging means for urging said plurality of staples, supported by said second guide means, toward said anvil; and

(h) retaining means provided in the vicinity of said opening of said casing so as to retain the pair of legs of a foremost one of said plurality of staples to thereby place the crown portion thereof on said anvil, the foremost staple being shaped through the cooperation of the advancing ram with said anvil in such a manner that the pair of legs thereof are moved toward each other, and upon the shaping of the foremost staple, the foremost staple being brought out of retaining engagement with said retaining means.

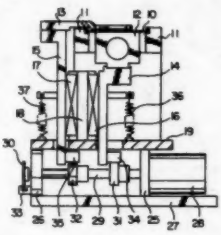
5,181,646

LEAD FRAME HOLDING APPARATUS FOR USE IN WIRE BONDERS

Hiroshi Ushiki, Saitama, and Noboru Fujino, Tokyo, both of Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Feb. 14, 1992, Ser. No. 836,993
Claims priority, application Japan, Feb. 15, 1991, 3-42359
Int. Cl.[5] B23K *37/00*
U.S. Cl. 228—4.5 **2 Claims**

1. A frame holding apparatus for use in wire bonders, said holding apparatus comprising (a) guide rails which support a lead frame, (*b*) a heater block installed so as to be under said lead frame and movable in a vertical direction, (c) a frame retainer installed so as to be above said lead frame and movable in a vertical direction, (d) a heater block raising-and-lowering cam and a frame retainer raising-and-lowering cam which respectively raises and lowers said heater block and frame retainer, (e) spring means installed so as to urge said heater block and frame retainer to move up and down via said heater block raising-and-lowering cam and frame retainer raising-and-lowering cam, and (f) a motor which rotates said heater block raising-and lowering cam and frame retainer raising-and-lowering cam, and said holding apparatus being characterized in that upward movement of said heater block and frame retainer is accomplished forcibly by said heater block raising-and-low-



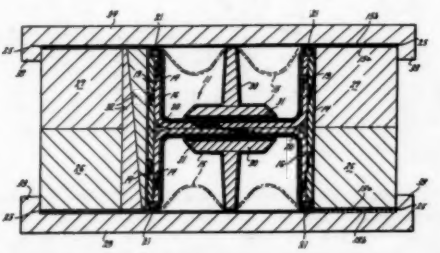
ering cam and frame retainer raising-and-lowering cam, a downward movement of said heater block and frame retainer is accomplished by said spring means, and when said heater block is moved to its upper limit position, said frame retainer is raised by an upward motion of said heater block.

5,181,647

METHOD AND TOOLING FOR FABRICATING MONOLITHIC METAL OR METAL MATRIX COMPOSITE STRUCTURES

Max R. Runyan, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 627,335, Dec. 14, 1990, Pat. No. 5,098,011.
This application Nov. 7, 1991, Ser. No. 788,918
Int. Cl.[5] B23K *37/04;* **B23P** *19/04*
U.S. Cl. 228—44.3 **6 Claims**



1. A tool for forming a structural member from at least two metal bondable elements and wherein bonding pressure for at least one bonding surface is supplied by at least one metal bladder, comprising:

first support means to positively support with an essentially zero tolerance, all surfaces of said structural member not acted upon by said at least one metal bladder;

second means to positively support, with an essentially zero tolerance, at least one of said surfaces of said structural member contacting said at least one metal bladder so that said expanded metal bladder may envelope said second means and apply force against said surface of said structural member; and

means to accommodate gas tubes for pressurizing said metal bladders.

5,181,648

METHOD AND APPARATUS FOR VAPOR PHASE SOLDERING AND CLEANING PRODUCTS

Helmut W. Leicht, Messerschmittring 61, 8901 Königsbrunn, Fed. Rep. of Germany

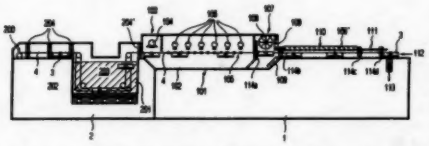
PCT No. PCT/EP89/01442, § 371 Date Jun. 12, 1991, § 102(e) Date Jun. 12, 1991, PCT Pub. No. WO90/06203, PCT Pub. Date Jun. 14, 1990

PCT Filed Nov. 28, 1989, Ser. No. 687,893

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1988, 3840098

Int. Cl.[5] H05K *3/34*

U.S. Cl. 228—201 29 Claims



1. In a method for vapor phase soldering and removing solder residues from products after the soldering process, in particular from printed-board assemblies or circuit modules, the improvement comprising removing solder residues from the products by washing the products with an inert cleansing fluid which is maintained as a liquid at a temperature below the melting point of the solder, and that the fluid used as cleansing fluid is the same as the one used as a heat transfer medium during the vapor phase soldering.

5,181,649

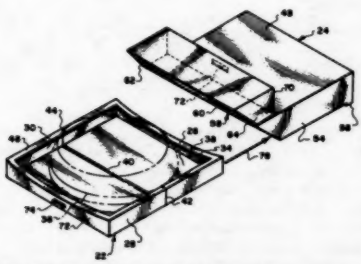
SANDWICH SERVING CONTAINER

John H. Frost, 781 S. Kohler St., Los Angeles, Calif. 90021

Continuation-in-part of Ser. No. 735,851, Jul. 25, 1991, abandoned. This application Jan. 16, 1992, Ser. No. 821,586

Int. Cl.[5] B65D *5/38*

U.S. Cl. 229—19 21 Claims



1. A sandwich serving container comprising:

a tray formed of a planar bottom having a peripheral edge, an upstanding wall attached to said planar bottom at said peripheral edge, said upstanding wall in combination with said bottom defining a chamber within which a sandwich is to be located, said tray including a bend line extending entirely across said planar bottom dividing said tray into a back section and a front section, said tray being locatable in either a closed position or a deflected position, with said tray i said closed position said planar bottom of said back section being aligned with said planar bottom of said front section, said front section assumes said deflected position by pivoting at said bend line relative to said back section causing said planar bottom of said front section to be angularly disposed relative to said planar bottom of said back section, whereby during consuming of a sandwich said back section is held in one hand of a human with said front section located at said deflected position which locates said front section to allow access to the sandwich by the mouth of the consumer with no interference to the lower lip, chin, neck or hands with said front section simultaneously functioning to catch and collect any food drippings that may occur during the consuming procedure; and

an enclosing lid comprising a substantially rigid walled body to close said chamber to the ambient preventing consuming of the sandwich, said enclosing lid to be separated completely from said tray permitting consuming of the sandwich.

5,181,650

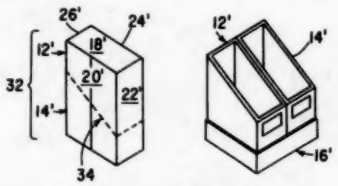
TRANSFORMABLE CARTON

Milton B. Hollander, Stamford, and David R. Jacobs, Norwalk, both of Conn., assignors to Omega Engineering, Inc., Stamford, Conn.

Filed Mar. 15, 1991, Ser. No. 670,238

Int. Cl.[5] B65D *5/32*

U.S. Cl. 229—103 4 Claims



1. A convertible container comprising:

a plurality of sidewalls formed of substantially planar carton stock;

said sidewalls being coupled together in a first position to configure said container in the form of a three-dimensional body having an outer shape generally corresponding to a rectangular solid;

said container having an accessible hollow interior space enclosed by said sidewalls and substantially corresponding to the outer shape defined by said sidewalls, for storing articles therein, when said sidewalls are in said first position;

portions of certain of said sidewalls being displaceable from said first position to a second position relative to other of said sidewalls and being engageable with said other of said sidewalls in said second position for altering both the inner shape and the outer shape of said container to accommodate different uses of said container; wherein,

said sidewalls of said container are arranged so that said container comprises a first, a second and a third open sided receptacle formed by said sidewalls, each receptacle being in the form of a three-dimensional rectangular solid having one open side and a central axis extending into the receptacle through the open side thereof, the open sides of said first and said second receptacles being disposed in abutting relationship in said first position such that said first and second receptacles together form said three-dimensional rectangular solid having said accessible hollow interior space;

said first and said second receptacles are received in nesting relationship within said third receptacle in said first position, with the central axes thereof each being disposed in substantially parallel relationship with each other and each lying in a plane which is substantially normal to the central axis of said third receptacle, to prevent separation of the abutting sides of said first and said second receptacles in the direction of the central axis thereof, and to maintain said accessible hollow interior space when said sidewalls are in said first position; and

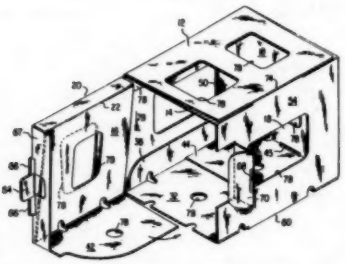
said first and said second receptacles are received in nesting relationship within said third receptacle in said second

position with the open sides thereof rotated substantially ninety degrees from the said first position such that the central axes of said first and second receptacles are substantially parallel to the central axis of said third receptacle, and the open sides of said first and second receptacles are accessible from outside said third receptacle to define an open-sided container having two parallel side-by-side compartments.

5,181,651
PAPERBOARD ASPARAGUS CARTON

Paul J. Oppenheim, San Jose, Calif., assignor to International Paper Company, Purchase, N.Y.

Filed Feb. 10, 1992, Ser. No. 833,276
Int. Cl.[5] B65D *5/42*
U.S. Cl. 229—121 **11 Claims**



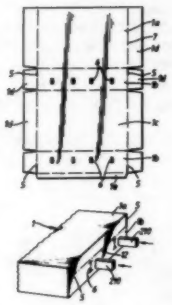
1. A paperboard carton formed from a unitary corrugated paperboard blank, the carton having a top closure, four side panels, each said side panel having a lower edge and an upper portion, and a bottom closure, said bottom closure including a plurality of at least partially overlapped bottom panels, said bottom panels foldably joined to respective lower edges of said side panels, said four side panels forming a rectangular tube, having three vertical edges formed by integral junctions of the side panels, two adjacent said side panels each having a free edge to thereby define two free side panel edges, first means releasably joining said free side panel edges together to form a fourth vertical edge of said rectangular tube, said top closure including two at least partially overlapped top panels, each of said at least two top panels foldably joined to the upper portion of a respective side panel, one of said at least two top panels having second means for securing it to the carton to releasably close it to the carton, two opposite of said four side panels each having a side spacer panel foldably joined to the upper end of a respective said opposite side panel, each side spacer panel positioned interiorly of the carton, whereby the carton can be releasably opened from either the top, or from one side.

5,181,652
PACKAGING

Pekka Tanttu, Espoo, and Osmo E. O. Valkeinen, Vantaa, both of Finland, assignors to Elopak Systems AG, Glattbrugg, Switzerland

Division of Ser. No. 600,015, Oct. 18, 1990, Pat. No. 5,059,082, which is a continuation of Ser. No. 305,749, Feb. 2, 1989, abandoned. This application Jul. 15, 1991, Ser. No. 729,562
Claims priority, application Finland, Feb. 2, 1988, 880476
Int. Cl.[5] B65D *5/42*
U.S. Cl. 229—243 **10 Claims**

1. A container for a compressible load comprised of a plurality of items, comprising a top wall, a bottom wall, four substantially vertical side walls distributed about said top wall and said bottom wall, preformed perforation means formed in two opposite side walls of the four side walls and whereby pushing means may penetrate said two opposite side walls to compress said load away from said two opposite side walls, and partially perforated linear wall portions which are substantially vertical

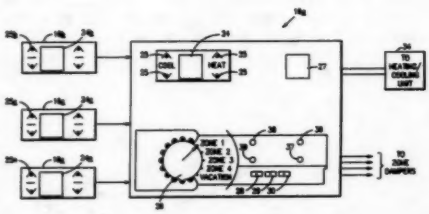


and located in regions of upper corners of said two opposite side walls.

5,181,653
RESIDENTIAL HEATING AND AIR CONDITIONING CONTROL SYSTEM

Glenn D. Foster, 10100 Baymeadows Rd., Apartment 1124, Jacksonville, Fla. 32256, and Charlie Moses, 4314 S. Naranja Dr., Jacksonville, Fla. 32217

Filed Mar. 3, 1992, Ser. No. 845,111
Int. Cl.[5] G05D *23/00*; F24F *3/44*
U.S. Cl. 236—49.3 **3 Claims**



1. A temperature control system for maintaining the temperature in each zone of a plurality of zones at predetermined set points for predetermined time periods by controlling the air flow into each zone comprising:

a master programmable thermostat positioned in a first zone and having a first damper associated therewith;

at least one slave thermostat positioned in at least a second zone and having at least a second damper associated therewith;

said master programmable thermostat having programming means for setting a first desired temperature to be maintained in said first zone and at least a second desired temperature to be maintained in at least a second zone, and for setting a first time period and at least a second time period for the respective desired temperatures, said programming means having means for setting a third desired temperature to be maintained in said first zone for a third time period and at least a fourth desired temperature to be maintained in said at least second zone for a fourth time period for controlling said first damper and said at least a second damper to control the air flow into the respective zones, and

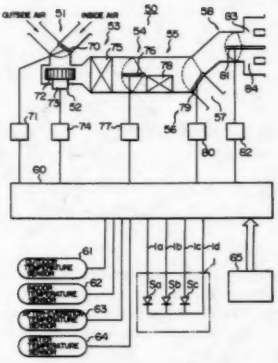
program temperature override means associated with said master programmable thermostat and said at least one slave thermostat for changing the current set desired temperature in a respective zone and only for the current

programmed set time period, whereupon at the end of the current programmed set time period the next previously programmed set desired temperature and set time period will be maintained.

5,181,654
SUNSHINE SENSOR AND AIR CONDITIONER FOR VEHICLE

Tomohisa Yoshimi, Gamagori; Shinji Iwama, Anjo; Yuuichi Kajino, and Hikaru Sugi, both of Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 2, 1991, Ser. No. 769,804
Claims priority, application Japan, Oct. 4, 1990, 2-268066
Int. Cl.[5] G01J *1/20*
U.S. Cl. 236—91 C **11 Claims**



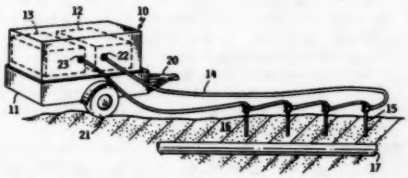
1. A sunshine sensor for use with a car comprising:
a first light receiving element having a light receiving surface facing upward;
a second light receiving element and a third light receiving element which each have a light receiving surface inclined toward a front side by an identical angle along an advancing direction of the car, said light receiving surfaces being symmetrically inclined with respect the car advancing direction along a horizontal direction vertical to the car advancing direction; and
adder means for adding to each other outputs respectively produced from said light receiving elements,
each of said light receiving surfaces respectively of said second and third light receiving elements having an inclination angle such that a vector obtained by adding normal vectors respectively of said light receiving surfaces of said respective light receiving elements has a direction substantially identical to a direction of sunshine which maximizes a quantity of heat supplied from the sunshine to the car.

5,181,655
MOBILE HEATING SYSTEM

Mark Bruckelmyer, 5617 McQuade Rd., Duluth, Minn. 55804

Filed Aug. 2, 1991, Ser. No. 739,465
Int. Cl.[5] E03B *7/14*
U.S. Cl. 237—1 R **9 Claims**

1. A heating system for thawing frozen ground comprising
a) a water reservoir and fluid lines connected to the water reservoir;
b) a first pump connectable to the lines for pumping fluid through the lines;
c) a heater coupled to the water reservoir for heating the water;
d) a plurality of heater probes connectable to the lines in series spaced arrangement, the heating fluid being pumped through the lines, each probe being elongate for insertion into the ground and having an inner and outer concentric tube, with the inner tube having an upper means for connecting to a line and a plurality of lower openings, and the outer tube having an upper means for connecting to the line for series flow of liquid through the inner and outer tubes;

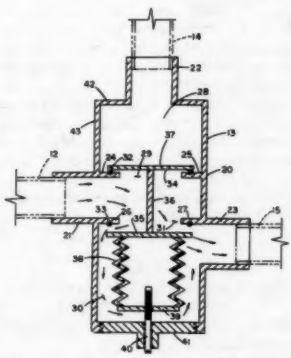


e) an antifreeze solution reservoir connectable to the lines for storing an antifreeze fluid for being pumped into the lines; and
f) two-way valves connected to control flow from the water reservoir and the antifreeze solution reservoir.

5,181,656
WATER RECIRCULATING APPARATUS

Gerald N. Schwerdt, 2146 Marshall Rd., Vacaville, Calif. 95687

Filed Dec. 16, 1991, Ser. No. 808,465
Int. Cl.[5] F24D *3/00*
U.S. Cl. 237—8 C **1 Claim**



1. A water recirculating apparatus, comprising in combination,
a hot water tank, the hot water tank including a hot water tank outlet conduit, and
a valve assembly, the valve assembly in fluid communication with the outlet conduit from the hot water tank, and
the valve assembly including a first outlet conduit and a second outlet conduit in fluid communication with the valve assembly, and
the first outlet conduit directed into a first valve, and the first valve in fluid communication with a water faucet, the water faucet including a cold water conduit directed to the water faucet and a cold water faucet valve mounted between the water faucet and the cold water conduit, and
the valve assembly second outlet conduit directed from the valve assembly to the hot water tank, and bypass means within the valve assembly for selectively directing water flow from the hot water tank to the first outlet conduit and the second outlet conduit when water is heated from a first temperature to a second temperature respectively, and
the valve assembly includes a housing, the housing including a first conduit tube receiving the hot water tank outlet

conduit, and a second conduit tube receiving the first outlet conduit, and a third conduit tube receiving the second outlet conduit, and including a side wall, a top wall, and a bottom wall, and the first valve chamber oriented within the valve assembly between the first conduit tube and the housing top wall, and the second conduit tube in fluid communication with the first valve chamber, and a second chamber oriented within the valve assembly between the second conduit and the housing bottom wall, and the third conduit tube in fluid communication with the second chamber, and bypass means includes a shuttle valve reciprocatably mounted and contained within the first chamber and second chamber to selectively direct fluid flow to the first chamber and the second chamber from the first conduit tube, and

the first conduit tube includes a first conduit first flange within the housing mounted to the housing side wall, and the first conduit first flange aligned with a first conduit third flange, and a first valve chamber opening defined between the first conduit first flange and the first conduit third flange, and the first conduit tube including a first conduit second flange oriented parallel to and below the first conduit first flange, and a first conduit fourth flange in coplanar spaced alignment relative to the first conduit second flange to define a second valve chamber opening between the first conduit second flange and the first conduit fourth flange, and the shuttle valve includes a first opening plate positioned above the first valve chamber opening spaced from and parallel a second opening plate positioned below the second valve chamber opening within the second valve chamber, and wherein the first opening plate is positioned within the first valve chamber, and a connecting web orthogonally and integrally mounted to the first opening plate and the second opening plate, and the bypass means further including a bi-metallic bellows mounted to the second opening plate contained completely within the second chamber, and a bellows plate mounted to the bi-metallic bellows in a spaced parallel relationship relative to the second opening plate, and a bellows plate adjusting rod rotatably mounted through the housing bottom wall and threadedly directed through the bellows plate to effect selective tensioning of the bi-metallic bellows relative to the first opening plate and the second opening plate.

5,181,657

COMPOSITE RUBBER/CONCRETE RAILROAD GRADE CROSSING SYSTEM

R. Andrew Davis, Lake Oswego, Oreg., assignor to Omni Rubber Products, Inc., Portland, Oreg.

Filed May 10, 1991, Ser. No. 698,137
Int. Cl.[5] E01C *9/04*
U.S. Cl. 238—8 **3 Claims**

1. A grade crossing system for extending a paved roadway across a railroad track formed by a pair of parallel rails having top surfaces which are coplanar with the surface of the roadway and supported on a plurality of laterally displaced spaced-apart ties, said system comprising:

(a) elastomeric pad unit located on each side of each rail, each said pad unit having a bottom surface that contacts and rests on the ties, a planar top surface that is coplanar with the top surfaces of the rails and a first edge that abuts one of the rails;

(b) non-elastomeric panels that fit between said pad units and between said pad units and the roadway, said panels having bottom surfaces that contact and rest on the ties and planar top surfaces that are coplanar with the top surfaces of the rails; and

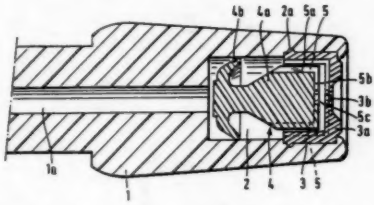
(c) said pad units and panels having abutting edges in which a linear portion of said panels overlaps a linear portion of said pad units with at least part of said overlapping portions defining a plane that angles upwardly from the ties extending toward the rail that is adjacent thereto.

5,181,658

NOZZLE WITH INCORPORATED VALVE

Alain Behar, Eu, France, assignor to Societe Francaise d'Aerosols et de Bonchage, Frivele-Escarbotin, France

Filed Aug. 16, 1991, Ser. No. 746,440
Claims priority, application France, Aug. 17, 1990, 90 10441
Int. Cl.[5] B05B *11/02, 1/34*
U.S. Cl. 239—493 **9 Claims**



1. An atomizing nozzle comprising:

a diaphragm member mounted on a housing so as to enclose a chamber therewith, said member being perforated by an axial orifice wherein said orifice is located at the distal end of said nozzle; and

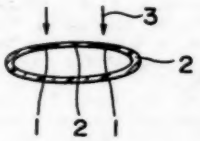
a unitary core and valve member comprising a valve portion and a core portion axially mobile and laterally guided within said chamber, said valve portion comprising a concave circular cup on an edge of said member remote from said orifice in which the edges of said cup engage an interior periphery of said chamber and are turned toward said orifice, and said core portion on an end of said member nearer to said orifice cooperating with said diaphragm to form a system of turbulent channels which supply said orifice.

5,181,659

SYNTHETIC RESIN SEAMLESS TUBE WITH BLACK PORTION(S) AND THROUGH-HOLES THEREIN

Tatsuta Ohe, Yamaguchi, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jan. 5, 1990, Ser. No. 461,292
Claims priority, application Japan, Jan. 7, 1989, 1-1876
Int. Cl.[5] B23K *26/00*
U.S. Cl. 239—556 **5 Claims**

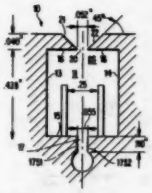


1. A seamless tube having holes, said tube being made of a synthetic resin, said tube comprising a substantially black synthetic resin portion and a substantially white synthetic resin portion alternately spaced about the tube's circumference, and said substantially black synthetic resin portion has small through holes.

5,181,660
LOW COST, LOW PRESSURE, FEEDBACK PASSAGE-FREE FLUIDIC OSCILLATOR WITH STABILIZER

Ronald D. Stouffer, Silver Spring, and Dharapuram Srinath, Hanover, both of Md., assignors to Bowles Fluidics Corporation, Columbia, Md.

Continuation-in-part of Ser. No. 759,557, Sep. 13, 1991. This application Oct. 8, 1991, Ser. No. 771,979
Int. Cl.[5] B05B *1/08*
U.S. Cl. 239—589.1 **5 Claims**



1. A low pressure fluidic oscillator which is free of feedback passages, comprising:

an oscillation chamber having a length greater than its width, a pair of mutually facing and complementary-shaped sidewalls and planar top and bottom walls, first and second end walls, oscillation stabilization means in said oscillation chamber,

means forming an input power nozzle in said first end wall having a width W and a depth D, for issuing a stream of fluid into said oscillation chamber, and form alternately pulsating, cavitation-free vortices in said oscillation chamber on each side of said stream,

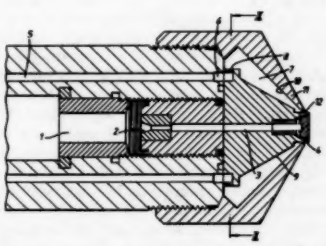
an outlet opening formed in said second end wall and axially aligned with said power nozzle and a width and depth such that internal pressure in said chamber is greater than ambient,

a pair of short sidewalls diverging in a downstream direction from said outlet opening, and wherein the ratio of length-to-width of said oscillation chamber is about 1.6 and said stabilization means includes ribs on at least one of said top and bottom walls.

5,181,661
ELECTROSTATIC SPRAY APPARATUS

Douglas J. Wollard, Huntingdon, United Kingdom, assignor to AB Ingredients Ltd., Huntington, United Kingdom

Filed May 30, 1991, Ser. No. 707,896
Claims priority, application United Kingdom, Jun. 1, 1990, 9012307
Int. Cl.[5] B05B *5/02, 7/10*
U.S. Cl. 239—704 **8 Claims**



1. An electrostatic spray apparatus comprising a source of liquid, an annular nozzle having a central axis and connected to the source of liquid for discharging a hollow tube of electrostatically charged liquid, a source of atomizing air under pressure, an annular atomizing air discharge nozzle surrounding said liquid discharge nozzle, an annular swirl chamber for said atomizing air, and a plurality of apertures connecting said source of air to said swirl chamber, each of said apertures being oriented at an angle to a radial direction relative to the central axis to initiate a substantially tangential swirling flow of air in the chamber characterised in that said apertures are disposed to allow air to pass radially outwardly into said chamber, said swirl chamber being defined by walls which tend to converge in an axial direction from said plurality of apertures towards said air discharge nozzle, and said source of liquid is electrostatically charged.

5,181,662
PROCESS FOR GRINDING CALCIUM CARBONATE IN AQUEOUS MEDIA

Hubert Bousquet, Caluire; Georges Ravet, Saint-Genis-Les-Ollières, and Jacky Rousset, Saint-Trivier-Sur-Moignans, all of France, assignors to Coatex S.A., Caluire, France

Continuation of Ser. No. 470,897, Jan. 26, 1990, abandoned. This application Jun. 25, 1991, Ser. No. 718,930
Claims priority, application France, Jan. 27, 1989, 89 01317
Int. Cl.[5] B01J *2/30*
U.S. Cl. 241—16 **20 Claims**

1. In a process for grinding coarse calcium carbonate in the presence of a water-soluble polymeric grinding agent composed of at least one acidic polymer and/or copolymer obtained from at least one carboxylated ethylenic monomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, crotonic acid, fumaric acid, maleic anhydride, isocrotonic acid, aconitic acid, mesaconic acid, sinapic acid, undecylenic acid, angelic acid, and α-hydroxyacrylic acid to produce an aqueous suspension of at least 70% by weight of calcium carbonate having a particle size no larger than about 2 μm and at least 60% of the particles having a particle size below 1 μm, the improvement which comprises:

maintaining the temperature of the aqueous suspension below 45° C. during the grinding step, wherein the grinding agent is introduced into the aqueous medium at an amount of 0.05% to 1.0% by weight relative to the dry weight of calcium carbonate.

5,181,663
TUB GRINDER WITH SCREEN PORTION

John P. Dorscht, P.O. Box 124, Union, Ontario, Canada N0L 2L0 , and Patrick J. Hogan, 549 Ferndale Ct., London, Ontario, Canada N6C 5C2

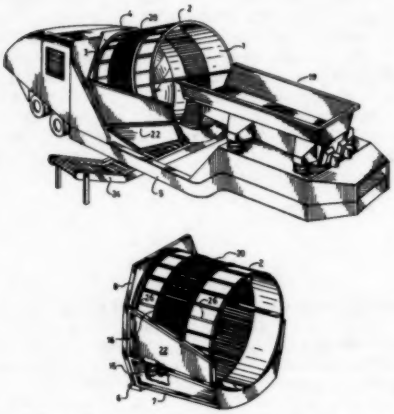
Filed Feb. 3, 1992, Ser. No. 829,317
Int. Cl.[5] B02C *13/286*
U.S. Cl. 241—81 **18 Claims**

1. Tub grinding apparatus, comprising:

a floor angled away from the horizontal, having an opening therethrough communicating with comminution means attached thereto, and a cylindrical wall positioned against and generally above said floor with its axis at a right angle thereto to define an angled receptacle for receiving material to be comminuted by said comminution means, said wall being rotatable with respect to said floor about said axis; and

means for rotating said cylindrical wall to cause tumbling of said material to be comminuted; where said cylindrical wall has classifying openings therethrough around a sub-

stantial portion thereof, whereby material small enough to pass through said classifying openings may fall from said



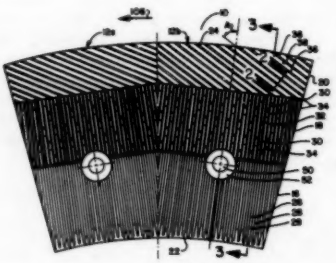
receptacle through said wall instead of being routed to said comminution means.

5,181,664

GRINDING PLATE WITH ANGLED OUTER BARS

Gregory R. Kohler, Williamsport, Pa., assignor to Andritz Sprout-Bauer, Inc., Muncy, Pa.

Filed Apr. 17, 1992, Ser. No. 870,584
Int. Cl.[5] B02C 7/12
U.S. Cl. 241—261.3 21 Claims



1. A grinding plate for the face of a refiner disc having a center and a substantially circular periphery, comprising:

a plurality of grinding plate segments arranged side-by-side on the face of the disc to form a substantially annular refining region having an inner edge near the center and an outer edge near the periphery of the disc;

each plate segment extending substantially radially and having a pattern of bars and grooves between bars, whereby material to be refined and steam produced during refining, can flow in the grooves in the general direction from the inner edge toward the outer edge of the refining region, the pattern including,

an inner pattern of substantially radially oriented inner bars and inner grooves, substantially each inner groove having dam structure for interrupting radial flow of material therethrough, and

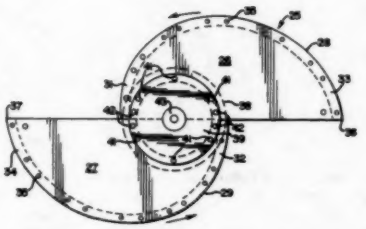
an outer pattern of outer bars and outer grooves, defining flow channels extending from the inner pattern to the outer edge of the plate segment at an angle of at least about 45 degrees relative to said general direction of flow through the inner grooves, wherein the flow channels do not have surface dams.

5,181,665

FOOD SLICING WITH MULTIPLE CUTTING SURFACE BLADE

Dennis G. Flisram, Plainfield, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Division of Ser. No. 586,066, Sep. 21, 1990, Pat. No. 5,065,656.
This application Oct. 8, 1991, Ser. No. 773,190
Int. Cl.[5] B02C 18/18
U.S. Cl. 241—292.1 5 Claims



1. A blade assembly for an apparatus to provide a series of sliced food products from a large stick of meat or other food product, the apparatus including means for supporting and feeding a food stick to and into a slicing assembly having a rotary mounted blade assembly which rotates into slicing engagement with the food stick, wherein said blade assembly comprises:

a substantially centrally positioned mounting member and a plurality of blade members, each said blade member having a curved cutting surface having a length adequate to cut completely through a perpendicular cross-section of the food stick, said curved cutting surface includes a leading edge of each curved cutting surface and which terminates at a trailing tip of the blade member curved cutting surface, each said blade member lying generally along a same plane, each blade member having a straight edge extending between said leading edge and said trailing tip, wherein a portion of the straight edge of a first blade member is adjacent to a portion of the straight edge of a second blade member such that the interface between said straight edge portions lies substantially coincident with a line between said trailing tips; and

each said leading edge of the curved cutting surface is spaced from said mounting member by a radial distance that is substantially less than the radial distance by which each said trailing tip is spaced from said mounting member, such that the leading edge of the curved cutting surface of one of said blade members is radially offset from the trailing tip of another of said blade members thereby defining a gap of said blade assembly which imparts a non-slicing mode to the apparatus when said blade assembly is rotating and when said supporting and feeding means is feeding the food stick to and into said slicing assembly, said blade assembly having at least two of said gaps, whereby the apparatus having said blade assembly is provided with alternating slicing modes and non-slicing modes, each said slicing mode beginning when the curved cutting surface of one of said blade members is in generally perpendicular severing and slicing engagement with the food stick and ending when a slice is completely severed from the food stick, and each said non-slicing mode being when the food stick is within one of said gaps and out of engagement with the rotating blade assembly, and whereby at least two slices of the food stick are severed from the food stick during each rotation of said blade assembly through the end of the food stick.

5,181,666

THREAD FEEDING DEVICE

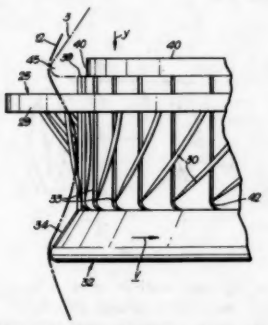
Bernd Bitzer, Albstadt, Fed. Rep. of Germany, assignor to Sipra Patententwicklungs-und Beteiligungsgesellschaft mbH, Albstadt, Fed. Rep. of Germany

Filed Feb. 21, 1992, Ser. No. 839,948

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1991, 4105981

Int. Cl.[5] B65H *51/20, 59/00*

U.S. Cl. 242—47.01 13 Claims



1. Strand feed device comprising: a storage drum having an axis of rotation, a storage section and an outrun section, the storage and outrun sections forming a peripheral surface; and a brake ring fitted on said outrun section and having a base ring surrounding but spaced from the peripheral surface and elastic, bristle-like elements, which have ends fixed on the base ring and distributed over the periphery thereof, and free ends lying on the side of the base ring facing away from the storage section and cooperating with the peripheral surface, wherein a strand can be wound substantially tangentially on to the storage section through rotation of the storage drum and in dependence on an amount to be stored thereon, and withdrawn substantially axially over the outrun section and through the brake ring, and wherein the peripheral surface of the storage drum is provided with means forming abutment faces, against which the free ends of the elements abut on rotation of the storage drum and thereby couple the brake ring in form-locking manner with the storage drum.

5,181,667

CASSETTE LOADER WITH PRECISION CASSETTE EXTRACTION AND WINDING REFERENCE POSITIONING MEANS AND METHOD

Robert I. Farrow, Burlington; Drey Johnson, Elon College, and Robert Gaude, Burlington, all of N.C., assignors to Concept Design, Graham, N.C.

Filed Nov. 6, 1990, Ser. No. 610,095

Int. Cl.[5] B65H *23/00, 18/00*

U.S. Cl. 242—56 R 13 Claims

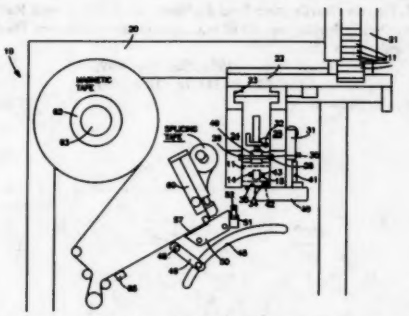
1. In a cassette loader for loading a length of magnetic tape into a cassette having opposing major sides, and opposing top, and bottom, and opposing first and second side edges, respective first and second capstan access through holes, the improvement comprising:

(a) positioning means for referencing the position of cassette at a loading station during loading and including:

(1) first engagement means comprising a support pin carried by the cassette loader for engaging the bottom of the cassette;

(2) second engagement means comprising a place bar powered by a fluid piston and cylinder assembly carried by the cassette loader for engaging the top of the cassette in opposition to said first engagement means; and

(3) cassette alignment means carried by the cassette loader and extending through one of the cassette capstan holes for aligning and supporting the cassette; one of said first or second engagement means including pressure means for



urging said first or second engagement means against the cassette and thereby the cassette under pressure against the other of sad first or second engagement means.

5,181,668

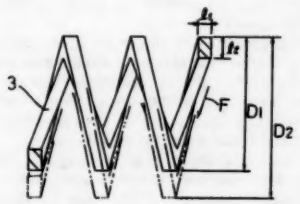
APPARATUS FOR RUNNING A WIRE THROUGH A PIPE

Toshinori Tsuji; Koichi Hosoya; Fumio Tsukimoto; Tatsuya Ashida, all of Osaka; Katsuyuki Okubo, Sakai; Tetsuo Bokuhara, and Toshiaki Shinzo, both of Osaka, all of Japan, assignors to Osaka Gas Co., Ltd. and Togawa Rubber Co., Ltd., both of Osaka, Japan

Division of Ser. No. 253,258, Oct. 4, 1988, abandoned. This application Sep. 26, 1990, Ser. No. 590,591

Int. Cl.[5] B65H *75/00*

U.S. Cl. 242—54 R 6 Claims



1. An apparatus for running a coil of wire through a pipe, comprising:

a feeding mechanism for feeding a coil of spring wire into a pipe and for retracting the coil out of the pipe while rotating the coil;

a driving mechanism for applying a driving force resulting from the rotation of the coil to the coil in directions of movement thereof at a position where the coil is caught by the pipe both when the coil is fed into the pipe and when the coil is retracted out of the pipe; and

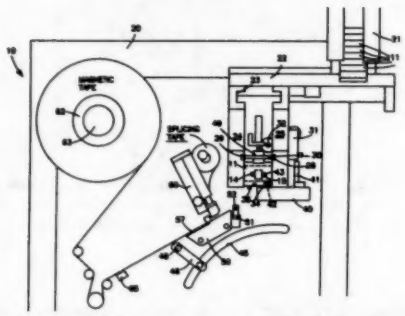
wherein said coil is formed of a spring wire material having a rectangular or trapezoidal cross-sectional shape such that it has a dimension diametrically of the coil designated as l_2 which exceeds its dimension longitudinally designated as l_1 and in which the dimensions l_1 and l_2 are in the following relationship: $l_1 < l_2 < 3l_1$, whereby the coil spring has a geometrical moment of inertia with respect to a bending force acting diametrically of the coil which exceeds a geometrical moment of inertia with respect to a bending force acting longitudinally thereof so that the coil spring has sufficient flexibility to run through bends in the pipe without breaking or deforming.

5,181,669

CASSETTE LOADER WITH SIMULTANEOUS LEADER TAPE EQUALIZATION AND LOADING

Drey Johnson, Elon College; Robert Gaude, Burlington; Robert I. Farrow, Burlington; Paul DeMint, Snow Camp, and Ray O. McNeill, Burlington, all of N.C., assignors to Concept Design, Graham, N.C.

Filed Nov. 6, 1990, Ser. No. 609,708
Int. Cl.[5] B65H *18/00, 81/00*
U.S. Cl. 242—56 R 3 Claims



1. A cassette loader for loading a length of magnetic tape into a cassette having a relatively short length of leader tape pre-loaded into the cassette and attached by opposite ends to respective first and second cassette hubs, said cassette loader comprising:

(a) a leader equalization position for holding a cassette;

(b) leader equalization means for winding the leader tape substantially completely onto one or the other of the first and second cassette hubs while the cassette is in the leader equalization position;

(c) a leader extraction position vertically spaced from said leader equalization position;

(d) leader extraction means for extracting the leader from the cassette while the cassette is in the leader extraction position;

(e) a cassette loading position horizontal spaced-apart from said leader extraction position for loading a length of magnetic tape into a cassette which has previously been processed in said leader equalization position;

(f) cassette loading means for loading a length of magnetic tape into the cassette at the cassette loading position simultaneously with the operation of the leader equalization means on another cassette in the leader equalization position;

(g) transfer means for transferring successive cassettes from said leader equalization position to said cassette loading position;

(h) said transfer means for transferring successive cassettes from said leader equalization position to said cassette loading position comprising a cassette loading lever having an outwardly extending cassette supporting shelf thereon, said loading lever being movable to:

(1) a first position wherein the cassette supporting shelf is positioned under the cassette and the cassette is supported on the cassette supporting shelf in the leader equalization position; and

(2) a second position wherein the cassette supporting shelf is withdrawn from under the cassette allowing the cassette to move vertically from the leader equalization position into the leader extraction position;

(i) wherein said cassette loading lever is movable from the second position to a third position, and in moving from the second to the third position, said loading lever moves the cassette from the leader extraction position to the cassette loading position; and

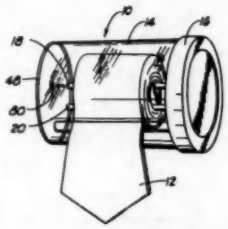
(j) ejection means for ejecting the cassette loaded with magnetic tape from the cassette loading position to permit loading of another cassette for loading.

5,181,670

STORAGE APPARATUS FOR STORING A NECKTIE

Douglas G. Eaton, 3206 Yorkshire Ct., Bloomington, Ill. 61704, and Robert D. Wallace, Bethany, Okla., assignors to Douglas G. Eaton, Bloomington, Ill.

Filed Jan. 23, 1992, Ser. No. 824,616
Int. Cl.[5] B65H *16/02;* B65D *85/18*
U.S. Cl. 242—67.1 R 7 Claims



1. A storage apparatus storing a necktie comprising:

a case having an outer peripheral surface, a first end and a second end with a case opening extending a distance through the case intersecting the first end of the case and forming a storage space within the case, a tie slot being formed in the case with the tie slot intersecting the outer peripheral surface of the case and intersecting the storage space with the tie slot having a first end intersecting the first end of the case and a second end spaced a distance from the second end of the case, the tie slot having a slot width and a slot length sized to slidingly receive the necktie;

a base connected to the second end of the case, the case having a case length extending between the first end of the case and the base;

a lid having an upper surface, a lower surface and an outer peripheral surface, the lid being removably connectable to the first end of the case;

a pair of rigid tie rods rigidly connected to the lower surface of the lid and extending a distance about perpendicularly from the lower surface of the lid,

the tie rods being spaced a distance from one another, the tie rods being about equal in length and being spaced a distance from the base when the lid is connected to the base, the tie rods being unconnected to each other with the lid providing the only connection between the tie rods, the lid being rotatable to wind the necktie about the tie rods with the necktie being slidingly moved through the tie slot and between the tie rods as the necktie is wound about the tie rods until the necktie is wrapped about the tie rods and disposed in the storage space.

5,181,671

PHOTOGRAPHIC FILM CASSETTE

Kazunori Mizuno, Minami-Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 18, 1991, Ser. No. 732,027
Claims priority, application Japan, Jul. 25, 1990, 2-196875
Int. Cl.[5] G03B *17/26*
U.S. Cl. 242—71.1 7 Claims

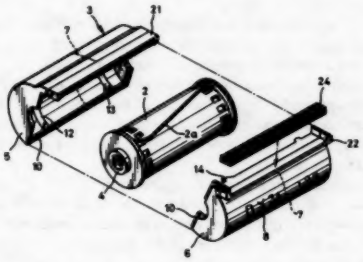
1. A photographic film cassette comprising:

a cassette shell made of resin, said cassette shell including two shell components each molded integrally, said two shell components comprising upper and lower shell halves joined together along a juncture;

a spool on which a photographic film is wound and which is rotatably contained in said cassette shell;

a port portion having a passageway for passing said film therethrough toward an outside of said cassette shell, said port portion including upper and lower covering members each attached to said upper and lower shell halves, respectively;

a coupling means for removably attaching said port portion to said cassette shell, said coupling means comprising a first projection and a first recess each formed on said



upper and lower covering members on lateral sides thereof, and a second recess and a second projection each formed on said upper and lower shell halves on lateral sides thereof for being coupled with each of said first projection and said first recess; and

a light trapping member provided within said passageway for trapping light coming through said passageway, said light trapping member being affixed to said port portion so as to be removable therewith from said cassette shell.

5,181,672

PHOTOGRAHIC FILM CASSETTE

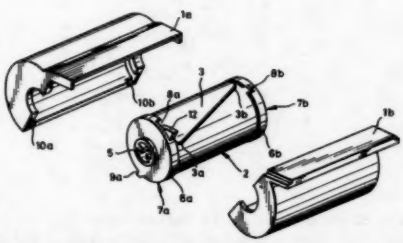
Hideaki Kataoka, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 16, 1991, Ser. No. 760,418

Claims priority, application Japan, Sep. 14, 1990, 2-245833

Int. Cl.[5] G03B *17/26*

U.S. Cl. 242—71.1 **9 Claims**



1. A photographic film cassette comprising:

a cassette shell having a film passage slit formed thereon;

a core on which a film roll is coiled, said core being contained within said cassette shell;

a pair of disks rotatably fitted on said core, said disks being fixed in position within said cassette shell so as not to be rotated when said core is rotated;

a circumferential lip formed on each of said disks at an outer circumferential periphery, said lips being engaged with an outermost turn of said film roll while said core is rotated in a direction of unwinding, such that said film roll is rotated along with said core without loosening said film roll in order to advance a leader of said film roll through said film passage slit to an exterior of said cassette shell; and

notches formed in said lips, proximate said film passage slit, such that said film leader, separated from said film roll, passes through said notches toward said film passage slit when said core is rotated in a direction of unwinding.

5,181,673

ANTI-TANK MISSILE SYSTEM

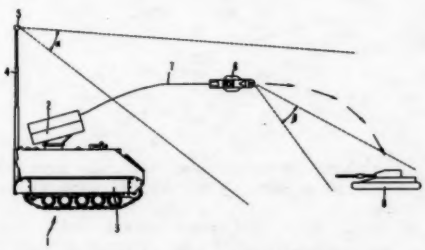
Gerhard Hubricht, Hagen; Bernd Schunk, Düsseldorf; Reinfried Stollewerk, Roetgen, and Jörg Peters, Erkrath, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Nov. 22, 1991, Ser. No. 795,852

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1990, 4037127

Int. Cl.[5] F41G *7/32*

U.S. Cl. 244—3.12 **3 Claims**



1. In an anti-tank missile system including a weapons carrier system, a missile carried on the weapons carrier system, the missile including control means for controlling the missile flight path and a searchhead camera for developing target data during flight of the missile, an elevatable platform mounted on the weapons carrier system, a sighting device camera disposed on the elevatable platform for sighting a target, with target data being compiled before a launch of the missile with the aid of the sighting device camera, and a fire guidance computer in the weapons carrier system for calculating a flight course for the missile, the improvement comprising:

a light waveguide connected between said missile and said weapons carrier system for transmitting target data developed by said searchhead camera for use by said fire guidance computer and for transmitting guidance signals generated by said fire guidance computer for controlling said control means for guiding said missile during its flight; and wherein said sighting device camera is a high resolution camera and the searchhead camera has at least one of a lower resolution and different spectral range than said sighting device camera.

5,181,674

WIND DRIVEN CRAFT

William J. Apgar, Duncraig, Australia, assignor to Sea Shelf Engineering Pty Ltd., Australia

PCT No. PCT/AU89/00208, § 371 Date Jan. 8, 1991, § 102(e) Date Jan. 8, 1991, PCT Pub. No. WO89/11417, PCT Pub. Date Nov. 30, 1989

PCT Filed May 16, 1989, Ser. No. 602,337

Claims priority, application Australia, May 16, 1988, PI8245

Int. Cl.[5] B64C *31/02*

U.S. Cl. 244—47 **17 Claims**

1. A wind driven craft comprising:

a body;

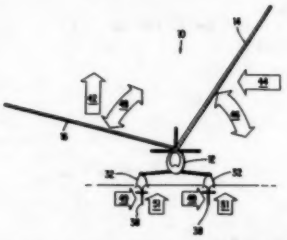
a pair of wings pivotably attached to and extending from said body, each one of said pair of wings having a respective longitudinal axis;

said wings being pivotable individually about at least one substantially longitudinal axis of said body and lockable in a selected relative position such that they are pivotable in unison, the pivotability of said wings about said at least

one substantially longitudinal axis of said body enabling each wing to be pivoted individually into a selected position and locked in said selected position such that one said wing provides primarily lift and the other said wing provides primarily thrust to said wind driven craft;

said wings being pivotable individually about a respective axis which is substantially parallel to the respective longitudinal axis of each wing;

aerodynamic control surface means positioned rearwardly of each said wing and connected thereto by respective



strut means such that each said aerodynamic control surface means is pivotably held by said respective strut means;

said aerodynamic control surface means adapted to be pivoted to cause a respective wing to pivot about a said axis substantially parallel to the longitudinal axis of a said wing to thereby enable the lift/thrust forces on a respective wing to be controlled such that the angle of attack of a respective wing may be changed relative to air flow to thereby alter the lift/thrust force on a said wing.

5,181,675

POD FOR SUSPENDING A TURBOJET ENGINE UNIT OF THE BYPASS TYPE UNDER THE WING OF AN AIRCRAFT

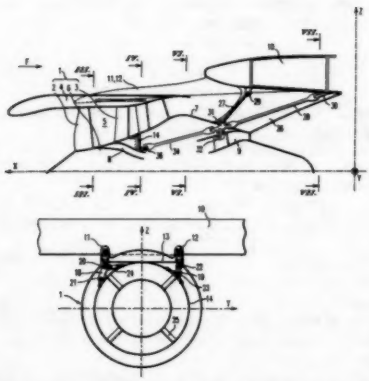
Alain, M. J. Lardellier, Melun, and Patrick W. R. Saillot, Vaux le Penil, both of France, assignors to Societe Nationale d'Etude et Moteurs d'Aviation S.N.E., Paris, France

Filed May 22, 1992, Ser. No. 886,838

Claims priority, application France, May 23, 1991, 91 06198

Int. Cl.[5] B64D *27/00*

U.S. Cl. 244—54 **6 Claims**



1. A pod for suspending a turbojet engine unit below the wing of an aircraft, said engine defining a longitudinal axis of rotation and including a fan casing, an intermediate casing and an exhaust casing, the pod including suspension means comprising:

two front beams situated at the same height and spaced from each other when viewed in a transverse plane perpendicular to said longitudinal axis of said engine, each of said beams being connected at one end to said fan casing and at the other end to said wing,

cross-bracing interconnecting said two front beams in a substantially horizontal plane at the level of said fan casing,

first connection means connecting said two front beams at the level of the downstream edge of said cross-bracing to at least one fixed part of said turbojet engine,

two rear rods situated in the same longitudinal plane passing through said longitudinal axis of said engine,

respective attachments fixed to said wing, said rear rods being pivotally connected at one end to said respective attachments,

and second connection means common to both of said rear rods and connecting said rods to at least said exhaust casing, each of said rods being pivotally connected to said second connection means at the end opposite said one end of the rod.

5,181,676

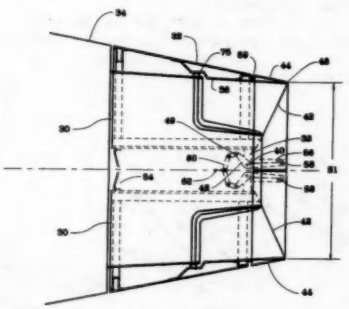
THRUST REVERSER INTEGRATING A VARIABLE EXHAUST AREA NOZZLE

Jean-Pierre Lair, 8023 Vantage, Suite 1450, San Antonio, Tex. 78230

Filed Jan. 6, 1992, Ser. No. 817,278

Int. Cl.[5] B64C *25/68*

U.S. Cl. 244—110 B **17 Claims**



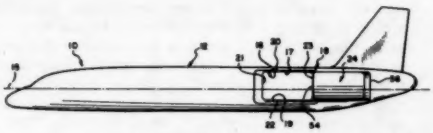
1. A thrust reverser for jet engines comprising a pair of symmetrical thrust reverser door members, each of said door members being pivotally mounted on an axis which is substantially diametrically positioned with respect to the exhaust nozzle of an engine so as to pivot between a stowed position in which said doors are out of the direct path of exhaust from the engine and a deployed position in which said doors are in the path of the engine exhaust for deflecting the exhaust and creating a braking thrust, said doors having a scarfed trailing edge, a pair of half-shells surrounding at least the trailing edges of said doors and forming a planar exhaust outlet for the engine and being pivotally mounted to a mounting arm, said mounting arm being pivotally mounted to said axes, actuator means for moving said door mounting axes and thereby moving said reverser doors and said half-shells for varying the area of said planar exhaust outlet between minimum and maximum exhaust area positions, and second actuator means for pivoting said doors between said stowed and deployed positions.

5,181,677

SLIDING AIRCRAFT DOOR

Abraham M. Kaplan, and Joyce Kaplan, both of 10431 Mira Vista, Tustin, Calif. 92705

Filed Sep. 26, 1991, Ser. No. 767,035
Int. Cl.[5] B64C *1/14*
U.S. Cl. 244—129.5 17 Claims



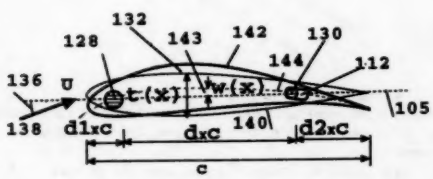
1. In an aircraft having a fuselage with a longitudinal axis and a protective skin through which an access opening is defined, the improvement comprising a pair of parallel tracks extending fore and aft relative to said longitudinal axis and located at the top and bottom of said access opening and spanning said access opening and anchored to said fuselage above and below said access opening in said skin, a door secured to said tracks and mounted only for sliding reciprocal translational movement and only along said tracks fore and aft relative to said longitudinal axis, and means for releasably immobilizing said door relative to said tracks.

5,181,678

FLEXIBLE TAILORED ELASTIC AIRFOIL SECTION

Sheila E. Widnall; William S. Widnall, both of Lexington, Mass.; William E. Gorgen, Wayzata, Minn., and Jeffrey T. Evernham, Carmel, Ind., assignors to Flex Foil Technology, Inc., Lexington, Mass.

Filed Feb. 4, 1991, Ser. No. 650,472
Int. Cl.[5] B64C *3/52*
U.S. Cl. 244—219 50 Claims



1. A flexible elastic airfoil for generating lift as a result of cambered deflection under load in a moving fluid medium, mounted on a support structure attached to an apparatus operating in contact with a moving fluid medium, said flexible airfoil assembly comprising

a) a flexible elastic airfoil section having a leading edge, a trailing edge, a chord c and an exterior profile of a general continuous streamlined shape such that adjacent points on said exterior surface remain in contact as the airfoil deflects in camber, the airfoil being generally made of flexible materials,

b) means for pivotably mounting the airfoil near its leading edge forming a leading edge pivot axis, said leading edge pivot axis mounting means attached to the support structure, said leading edge pivot axis mounting means constructed and arranged for passive rotation about the pivot axis the leading edge pivot axis being located a distance in the chordwise direction from the leading edge of the airfoil not exceeding 0.25 of the chord c of the airfoil,

c) means for pivotably mounting the airfoil near its trailing edge forming a trailing edge pivot axis, said trailing edge pivot axis mounting means attached to the support structure, said trailing edge pivot axis mounting means constructed and arranged for passive rotation about the pivot axis the trailing edge pivot axis being located a distance in the chordwise direction from the leading edge of the airfoil of at least 0.6 of the chord c of the airfoil, with the distance between the leading edge pivot axis and the trailing edge pivot axis being at least 0.6 c,

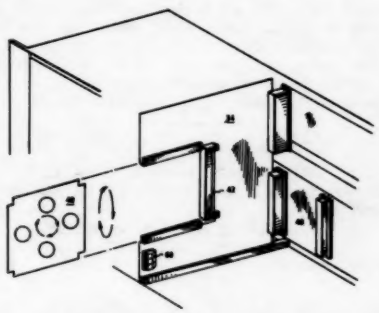
d) means to permit the airfoil section to slide in a direction generally aligned with its undeformed centerline to permit proportional cambered deflection of the airfoil under load, the sliding means incorporated into one or both of the pivot axis mounting means.

5,181,679

RAILWAY TRAIN SPEED RESTRICTION APPARATUS

Klaus Frielinghaus, and Steven M. Ferrarese, both of Rochester, N.Y., assignors to General Railway Signal Corporation, Rochester, N.Y.

Filed Aug. 22, 1991, Ser. No. 748,576
Int. Cl.[5] B61L *3/08*
U.S. Cl. 246—182 R 19 Claims



1. In a railroad train speed control system having a source providing a plurality of control signals concerning allowable train speeds over a section of track, an improved apparatus for restricting the injection of said control signals corresponding to allowed train speeds above a certain speed said apparatus comprising means responsive to said control signals for generating signals for injection into said tracks and said apparatus having a first member having a first set of contacts, a plurality of contacts in said first set being connected to said source and at least one contact in said first set being connected to said generating and injection means, said apparatus having a second member having a plurality of sets of second contacts each in a different position on said second member, different ones of said second sets of contracts being engagable with said first set of contacts to provide different connections between the contacts of said first set for restricting the application of control signals above different allowed speeds to said injection means when said second member is received by said first member in different ones of said positions to provide engagement between said first contacts and different ones of said plurality of second sets of contacts.

5,181,680

TRAP SLEEVE MOUNTING BRACKET

Gene Coll, Cranford, N.J., assignor to Diamond Communication Products, Inc., Garwood, N.J.

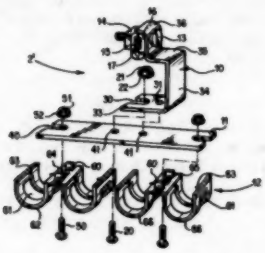
Filed Aug. 27, 1991, Ser. No. 750,089
Int. Cl.[5] E21F *17/02*
U.S. Cl. 248—61 13 Claims

1. A trap sleeve mounting bracket for mounting a plurality of trap sleeves on a cable, comprising:

a tap bracket having a cable-connecting portion and a planar bottom portion:

connecting means for connecting the cable-connecting portion of the tap bracket to the cable;

a planar adapter plate removably attached to the planar bottom portion of the tap bracket; and at least one W-shaped clip removably attached to said planar adapter plate and having two cradle portions adapted to hold two



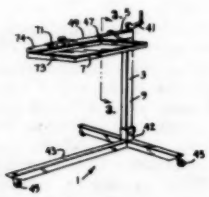
trap sleeves in substantially parallel relationship to the cable, each of the cradle portions being provided with a window opening therein which allows visual inspection of a trap mounted therein; wherein the bottom portion of the tap bracket comprises a projection which engages an aperture formed in the adapter plate to maintain a constant orientation between the tap bracket and the adapter plate.

5,181,681

ADJUSTABLE STAND APPARATUS

Johnny W. Edwards, 11319 E. 13th St., Independence, Mo. 64052

Filed Feb. 12, 1991, Ser. No. 653,955
Int. Cl.[5] A47G *29/00*
U.S. Cl. 248—125 **4 Claims**



1. An adjustable stand comprising:

(a) a frame having a substantially vertically oriented leg connected to a substantially horizontally oriented arm wherein:

(1) said leg has a rectangularly shaped outer sleeve and a cylindrically shaped alignment sleeve for slidable axial displacement within said leg outer sleeve; said leg further has a cylindrically shaped inner sleeve for rotational displacement within said alignment sleeve and a threaded rod for axially displacing said alignment sleeve and said leg inner sleeve relative to said leg outer sleeve; said leg further has a removable leg sphere contained in a depression formed in said alignment sleeve to prevent rotational displacement between said leg outer sleeve and said alignment sleeve;

(2) said arm has a rectangularly shaped outer sleeve and a cylindrically shaped inner sleeve for slidable axial displacement within said arm outer sleeve; said arm further has a first pair of spheres contained in a first pair of depressions formed in an inner surface of said arm outer sleeve near the distal end thereof; said arm further has a second pair of spheres contained in a second pair of depressions formed in an outer surface of said arm inner sleeve contained within said arm outer sleeve such that rotational displacement between said arm outer sleeve and said arm inner sleeve is prevented; said first pair of spheres cooperating with said second pair of spheres such that said arm inner sleeve is cantilevered from said arm outer sleeve; said arm further has a platform depression formed in an outer surface of said arm inner sleeve near the cantilevered distal end thereof;

(b) a platform having a rectangularly shaped platform sleeve and a tray extending transversely from said platform sleeve; said platform sleeve dimensioned to slidably and rotatably telescope over the cantilevered distal end of said arm inner sleeve; said platform sleeve having a pair of glide spheres contained in a pair of depressions formed in an inner surface of said platform sleeve; said platform sleeve having a rotation limiting sphere contained in said platform depression of said arm inner sleeve; said tray having a substantially planar bottom wall constructed of ferrous material and at least one side wall; and

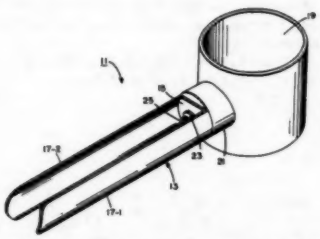
(c) a resilient pad constructed of permanently magnetized material for detachable securement to said tray bottom wall and to those of said tools and parts which contain ferrous material.

5,181,682

TOOL HOLDER

Joseph A. Indelicato, Bellingham, Mass., assignor to Luanne Kiley and John R. Newman, both of Bellingham, Mass., part interest to each

Filed May 13, 1991, Ser. No. 699,364
Int. Cl.[5] E06C *7/00*
U.S. Cl. 248—210 **2 Claims**



1. A device for holding an elongated hand tool of a tradesman in close proximity to his area of work while he is working on an extension ladder having a plurality of hollow rungs comprising:

a) a cylindrical section of piping adapted to hold an elongated hand tool,

b) a generally U-shaped mounting member adapted for insertion into one of the hollow rungs, said generally U-shaped mounting member being shaped to define a base portion and a pair of generally parallel legs, said pair of legs being concave in shape and being outwardly biased to press against the inside walls of the hollow rung, said base portion being disposed between said pair of generally parallel legs; and

c) means for mounting said cylindrical section of piping on said base portion of said generally U-shaped mounting member.

5,181,683

REMOVABLE HANGER

Harold C. Smith, 1101 Birchcrest Rd., Bellevue, Nebr. 68005

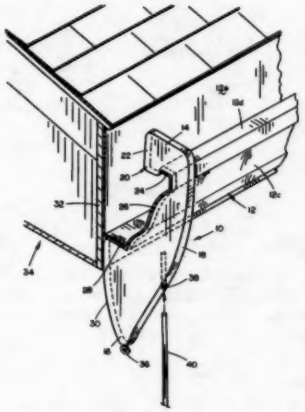
Filed Mar. 11, 1992, Ser. No. 850,466
Int. Cl.[5] A47K *1/00*
U.S. Cl. 248—227 **8 Claims**

1. A hanger for removable engagement With a roof gutter, the roof gutter mounted on a fascia board on a roof, and of the type including a rearward panel, a bottom panel, and a forward panel with an upper lip, comprising:

a rigid body having an upper end, lower end and forward edge;

said upper end including a rearwardly extending hook portion having a rearward edge, a bottom edge, and a hook interior surface adapted to receive the gutter upper lip;

said body having an intermediate rearward edge extending downwardly and rearwardly from said hook interior surface to a lower end connected to a lower edge, said



intermediate rearward edge extending rearward beyond the hook portion rearward edge; and

said body having a lower rearward edge extending vertically downwardly from the lower end of said intermediate lower edge to the lower end of said body;

said lower rearward edge including a portion for abutting the fascia board when the hook portion is connected to the gutter lip.

5,181,684

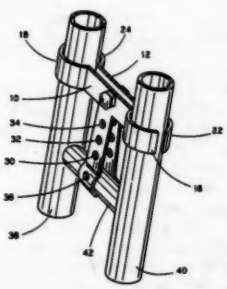
BICYCLE GENERATOR MOUNTING BRACKET

Paul Sager, Franklin, Mass., assignor to Andrew Fischer, Boston, Mass.

Filed Dec. 2, 1991, Ser. No. 801,431

Int. Cl.[5] A47B *96/06*

U.S. Cl. 248—231.6 **1 Claim**



1. A support bracket for the mounting of a generator over the rear wheel of a bicycle comprising in combination: A pair of opposed tee shaped members, each of said tee shaped members having a vertical portion and a horizontal portion, a semi-cylindrical cup member formed at a bottom terminus of the vertical portion and at each of the horizontal portion, said semi-cylindrical cup members thus forming three opposed pairs of semi-cylindrical cup members for providing clamping engagement to the bicycle frame, a plurality of aligned holes formed through the vertical portion and an aligned hole formed in the horizontal portion, the vertical portion and the horizontal portion respectively receive clamping bolts and generator mounting bolts whereby the support bracket can be clampingly attached to the bicycle frame and the generator can be attached to the support bracket.

5,181,685

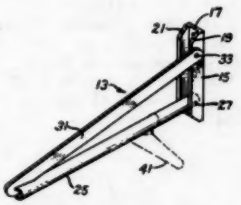
COLLAPSIBLE HANGER BAR

Vladimir Ostapowicz, 1782 Nisson Rd., #69, Tustin, Calif. 92680

Filed Oct. 9, 1991, Ser. No. 774,076

Int. Cl.[5] E04G *3/00*

U.S. Cl. 248—293 **2 Claims**



1. A collapsible hanger bar comprising:

wall anchoring member means for attachment to a planar surface and for providing pivotal support;

an elongate tubular member having a first end pivotally supported by said wall anchoring member for pivotal movement in a vertical plane, and a second end having an open bore; and

a flat bar, having a first end pivotally supported by said wall anchoring member for pivotal movement generally in a vertical plane, and a second end having an angled slot, said angled slot fittably engageable with said open bore.

5,181,686

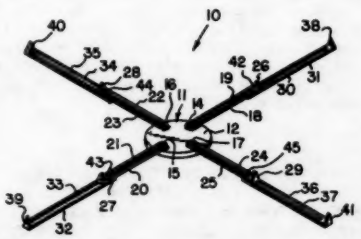
PAINTED ARTICLE SUPPORT APPARATUS

James R. Barthel, 532 Howard St., Belding, Mich. 48809

Filed Feb. 27, 1992, Ser. No. 842,265

Int. Cl.[5] A47B *91/00*

U.S. Cl. 248—346 **3 Claims**



1. A painted article support apparatus, comprising,

a support housing, the support housing including a bottom wall and a top wall spaced from and parallel the bottom wall, and

the top wall including a top wall periphery, and

a plurality of first axle members fixedly and orthogonally mounted to the top wall adjacent the periphery, and

each of the first axle members includes a first leg, each first leg including a first leg rear end portion and a first leg forward end portion, and

an elongate slot directed longitudinally through each leg

rear end portion and forward end portion, and each slot receiving one of the axle members therethrough, and

each forward end portion of each leg including a first projection fixedly and orthogonally mounted to the forward end portion of each leg projecting thereof above the top wall, and

each leg includes a further leg, each further leg including a further leg forward end portion and a further leg rear end portion, and each further leg including a further leg slot longitudinally directed of each further leg between the further leg forward end portion and the further leg rear end portion, and a further axle directed through each further leg slot and the slot of said leg to slidably mount the further leg to the leg, and each further leg includes a further leg projection fixedly and orthogonally mounted to the further leg forward end portion of each further leg.

5,181,687

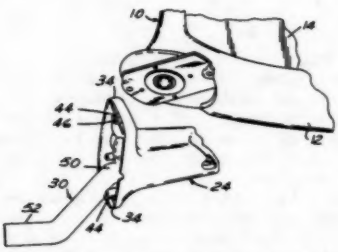
VEHICLE REAR VIEW MIRROR MOUNTING BRACKET

Richard W. Kerper, Beverly Hills, Mich., assignor to Delbar Products, Inc., Bloomfield Hills, Mich.

Filed Oct. 1, 1991, Ser. No. 770,999

Int. Cl.[5] B60R *1/02*

U.S. Cl. 248—479 **11 Claims**



1. A mounting bracket for an exterior rear view mirror assembly of a vehicle, the vehicle having an entry door including opposite spaced apart outer and inner door panels, the mounting bracket comprising:

a platform portion for supporting the exterior rear view mirror assembly;

means for securing the platform portion to the outer door panel; and

an arm portion extending through the outer door panel, the arm portion including a first end and a second end, the first end of the arm portion being connected to the platform portion and the second end of the arm portion being adapted to be secured to the inner door panel at a point of securement, the second end of the arm portion comprising a flange which is generally co-planar with the inner door panel at the point of securement.

5,181,688

MECHANISM FOR COUPLING A COMPONENT WITH A VEHICLE

Wayne R. Hutchison, Mayville; Jon M. Patterson, Wauwatosa; Terry D. Hardesty, Columbus; Richard D. Teal, Horicon; Eugene G. Hayes, Beaver Dam, all of Wis.; Michael J. Coffey, Sanford, and Earl T. Moore, Midland, both of Mich., assignors to Deere & Company, Moline, Ill.

Filed Jun. 14, 1991, Ser. No. 715,158

Int. Cl.[5] F16M *1/00*

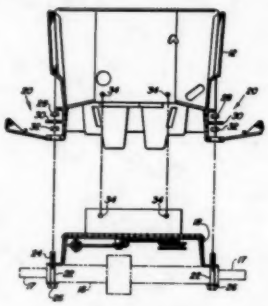
U.S. Cl. 248—680 **30 Claims**

1. A mechanism, comprising:

a frame member made at least partially of a plastic material, and to which a component may be coupled, said component and frame defining respective generally aligned openings,

a tension member received by the openings in the component and frame, said tension member including a clamping means for operatively pressing the frame and component together securely, and

spacer means rigidly coupled with the tension member for securely remaining in position with respect to the tension



member when the clamping means is released, said spacer means being positioned within the opening defined by the frame for limiting the degree to which the frame is compressed while being operatively pressed against the component.

5,181,689

PIPE JOINT APPARATUS

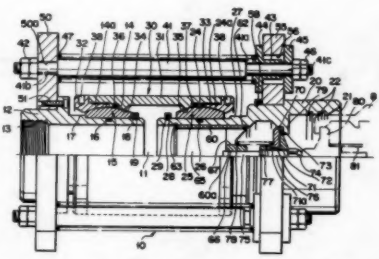
Reichi Makishima, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1991, Ser. No. 791,282

Claims priority, application Japan, Nov. 20, 1990, 2-121391

Int. Cl.[5] F16L *29/00, 27/12*

U.S. Cl. 251—149.6 **5 Claims**



1. A pipe joint apparatus, which includes first joint means having a socket, second joint means having a plug detachably connected to said socket, a connecting section for connecting a fixing pipe to one of first and second joint means, and a connecting section for connecting a non-fixing pipe to the other joint means, comprising:

a first cylindrical member arranged on the side of said connecting section for connecting said non-fixing pipe to said other joint means of first and second joint means, and connected to said other joint means to be detachable from said other joint means;

a second cylindrical member arranged in said one joint means to be spaced from said first cylindrical member and to be opposite to said first cylindrical member, and connected to said fixing pipe;

each of said first and second cylindrical members having spherical rotation portions;

sleeve means having opposite end portions coupled to outer peripheral surfaces of both first and second cylindrical

members through the respective spherical rotation portions, and forming a fluid passage enclosing said outer peripheral surfaces of said first and second cylindrical members;

a first support member supporting said first cylindrical member;

a second support member spaced from and opposite to said first support member and supporting said second cylindrical member;

a plurality of coupling shafts disposed about said sleeve means and extending between said first and second support members;

fixing means for fixing each coupling shaft to one of first and second support members;

coupling means, providing in a coupling portion between said other support member and said coupling shaft, for coupling said first and second support members to be relatively freely deflected in a direction crossing at a right angle to the axial direction of said coupling shaft, said coupling means being formed in said support members, and said coupling shaft being inserted into a through hole having a hole diameter larger than the outer diameter of said coupling shaft, said coupling shaft comprising a collar having a flange whose diameter is larger than the hole diameter of said through hole, and a spacer holding said support member in which through hole is formed together with said flange;

a spring member between said first and second support members pressing said first and second support members in a direction away from each other, and applying spring force restricting the relative deflection between said coupling shaft and said first or second support member;

said spring member being formed of a compression coil spring, and said coupling shaft being inserted into the coil of said spring member; and

a spring receiving portion of said spring member being formed of the flange of said collar.

5,181,690

SHUT-OFF VALVE

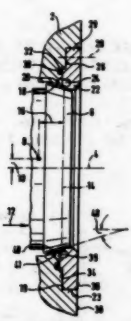
Wolfgang Gonsior, Lindau-Bodolz, Fed. Rep. of Germany, assignor to XOMOX International GmbH & Co., Linday, Fed. Rep. of Germany

Filed Aug. 8, 1991, Ser. No. 741,957

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1990, 4025832

Int. Cl.[5] F16K *1/22*

U.S. Cl. 251—172 **20 Claims**



1. A shut-off and regulating valve comprising a housing, a valve disk journaled in said housing and having a sealing surface thereon, and a seat ring with which said valve disk can be brought into contact, wherein said seat ring is fastened directly in said housing by means of a seat holding ring portion which is an integral part of said seat ring, said seat ring is provided with a radially deformable resilient sealing lip which engages said sealing surface of said valve disk under radial bias, said seat ring has an axis and is initially formed with said sealing lip having substantially cylindrical inside and outside surfaces parallel to the axis of the seat ring, said sealing lip is subsequently permanently bent radially outwardly through a first angle by initial closure of said valve disk, said sealing lip is elastically deformed radially outwardly through a further angle each time said valve disk is closed, and said first angle is larger than said further angle.

5,181,691

MECHANICAL PART MADE OF CERAMICS

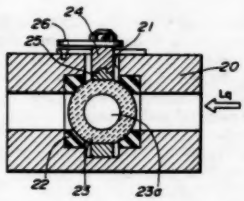
Masato Taniguchi; Juzo Yagi, and Hiroshi Takeda, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Division of Ser. No. 613,002, Nov. 15, 1990, Pat. No. 5,052,352, which is a division of Ser. No. 318,766, Mar. 3, 1989, abandoned. This application Jun. 20, 1991, Ser. No. 718,566

Claims priority, application Japan, Mar. 9, 1988, 63-55418

Int. Cl.[5] F16K *5/00*

U.S. Cl. 251—315 **1 Claim**



1. A ball valve comprising:

a seal ring having a fluid passage and a part-spherical contact surface; and

a ceramic main body rotatably received in said seal ring and having a part-spherical ceramic contact surface in sliding contact with the contact surface of said seal ring for controlling the opening and closing of said fluid passage;

said ceramic contact surface having a profile with a roughness spacing which ranges from 5 to 100 μm and with more than half of its peaks smoothly rounded, whereby said ceramic contact surface is capable of retaining lubricant on said ceramic contact surface while providing a relatively large contact surface area.

5,181,692

VALVE ASSEMBLY FOR PRESSURE FLUIDS

Walter Brausfeld, Hanover, Fed. Rep. of Germany, assignor to Mannesmann Akiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 13, 1992, Ser. No. 867,849

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1991, 4112463

Int. Cl.[5] F16K *51/00*

U.S. Cl. 251—367 **12 Claims**

1. A pressure fluid valve assembly, comprising,

a base plate having a first connection surface, first fluid connection openings debouching on said first connection surface, and a pair of opposite side surfaces having detent troughs (12);

a valve housing having a second connection surface, opposite to said first connection surface, a pair of opposite side surfaces having recesses (2*a*), said second connection surface having second fluid connection openings, and connection means for sealingly connecting said first fluid connection openings and said second fluid connection openings;

a yoke (9) extending in a longitudinal direction (8) below said base plate (1), said yoke having arms (9*a*, 9*b*) extending on said side surfaces (1*a*) of said base plate (1) and said

valve housing (2), each of said arms (9*a*, 9*b*) having a first detent projection (10) at a distal portion thereof for engagement with said recesses (2*a*) in said valve housing (2) and a second detent projection (11) at a proximal portion thereof for engagement with said detent troughs (12);

said yoke being movable with respect to said base plate (1) along an axis parallel to said side surfaces of said base plate between a locked position in which said first detent projections (10) engage said recesses (2*a*), urging said base

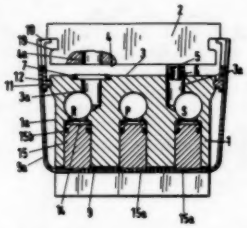


plate (1) and said valve housing (2) together, and an unlocked position in which said second detent projections (11) engage said detent troughs (12) thereby separating said arms (9*a*, 9*b*) so that said first detent projections (10) do not engage said recesses (2*a*), relieving a force between said base plate (1) and said valve housing (2); and

means for releasably locking said valve housing (2) to said base plate (1) based on a pressure condition in at least one of said first fluid connection openings.

5,181,693

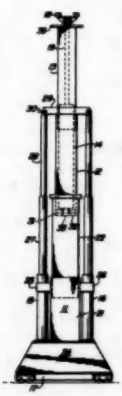
EXTENSIBLE LIFTING TOWER WITH HYDRAULIC CYLINDERS IN SERIES

Gary V. Lorenz, 5206 37th Ave. Ct., Moline, Ill. 61265

Filed Mar. 24, 1992, Ser. No. 856,708

Int. Cl.[5] B60P *1/00*

U.S. Cl. 254—2 R **5 Claims**



1. A lifting tower comprising: a base, an extensible stabilizing tower, a base hydraulic lifting means, and an upper hydraulic lifting means, said extensible stabilizing tower comprising a base stage, at least one intermediate stage and an upper supporting stage, each of said stages having a vertical rigid member, the lower end of said base stage being secured to said base, the rigid member of each stage overlapping an adjacent one of said stages, guiding means between adjacent ones of said overlapping rigid members for allowing only vertical travel above and into said base stage, means for connecting said base hydraulic lifting means upright between said base and the upper end of said upper supporting stage, a header for contacting a load connected to the top of said upper hydraulic lifting means, a platform secured to the bottom of said upper supporting stage, means for securing the lower end of said upper hydraulic lifting means to said platform, said base hydraulic lifting means being operative to extend said extensible stabilizing tower, and said upper hydraulic means being operative subsequently to lift said header to a level substantially higher than the highest level of the upper end of said base hydraulic lifting means.

5,181,694

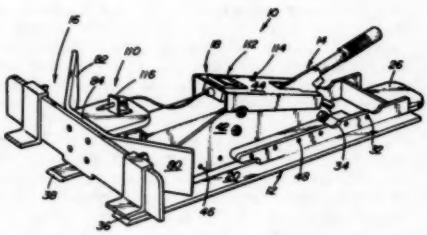
FLOOR COVERING INSTALLATION TOOL

Harvey C. Collins, 7143 S. River Rd., Marine City, Mich. 48039

Filed Apr. 8, 1992, Ser. No. 865,375

Int. Cl.[5] B66F *13/00*

U.S. Cl. 254—133 R **13 Claims**



1. A tool for lifting furniture to enable installation of floor covering under the furniture partitions comprising:

a frame;

means for raising and lowering a lifting member, said raising and lowering means coupled with said frame and lifting assembly;

said lifting assembly including a first member coupled with said raising and lowering means a second member removably coupled with said first member and including a planar surface for providing an abutment surface for the furniture to be lifted, and a third member releasably coupled with said second member, said third member providing a lifting, surface, which faces the same direction as said planar surface and said third member being slidable along a length of said surface for providing a plurality of lifting positions.

5,181,695

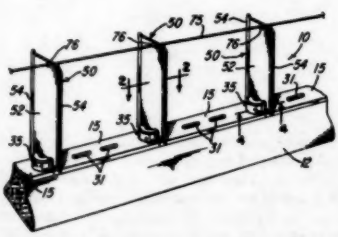
ANTI-GLARE SHIELD SYSTEM FOR HIGHWAY MEDIAN BARRIERS

W. Eugene Arthur, 1930 W. Winton Ave., Bldg. 11, Hayward, Calif. 94545

Filed Sep. 11, 1991, Ser. No. 757,829

Int. Cl.[5] E01F *7/06*

U.S. Cl. 256—13.1 **9 Claims**



1. An anti-glare shield system adapted for use on a highway

median barrier having a top surface, comprising a series of horizontally spaced and substantially vertical blades of semi-rigid material, each of said blades having a height substantially greater than its width and including an upper end portion and a lower end portion, a corresponding base member for each of said blades and having means defining a slot for receiving said lower end portion of said blade, means for releasably securing each of said blades to the corresponding said base member, a series of elongated base rail sections adapted to seat on the top surface of the barrier, said base rail sections each having a length corresponding to the horizontal spacing between said blades and having opposing end portions forming longitudinally spaced joints for said base rail sections along the top surface, said base members being mounted on said base rail sections overlying said joints, and a series of threaded bolts extending downwardly through said base members for quickly and positively securing said base members and the underlying said end portions of said base rail sections to the top surface of the barrier.

5,181,696

VEHICLE HEIGHT ADJUSTING DEVICE FOR ATTACHMENT TO A HYDRAULIC SHOCK ABSORBER FOR VEHICLES

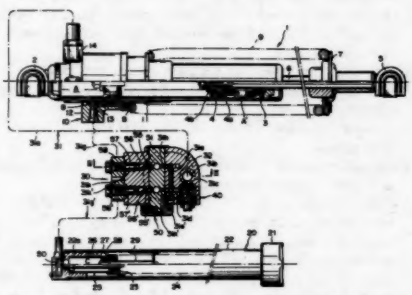
Shigenobu Abe, Hamamatsu, Japan, assignor to Kabushiki Kaisha Showa Seisakusho, Tokyo, Japan

Filed Aug. 16, 1990, Ser. No. 568,508

Claims priority, application Japan, Aug. 23, 1989, 1-214820

Int. Cl.[5] B60G *15/12;* **B62K** *25/04;* **F16F** *9/06, 9/50*

U.S. Cl. 267—64.17 **9 Claims**



1. A vehicle height adjusting device for a shock absorber of a vehicle, said shock absorber extending between an axle and a body portion of said vehicle, said device including:

a hydraulic jack unit attached to one of a body side and axle side of said shock absorber, a distance between the vehicle body and the axle being adjustable by a delivery of a fluid under pressure into said jack unit;

a fluid reservoir;

a source of fluid under pressure including a pump chamber formed within said shock absorber wherein compression and extension strokes of said shock absorber deliver fluid under pressure from said pump chamber;

a delivery line extending between said source of fluid under pressure and said jack unit through which said fluid under pressure is delivered to said jack units;

a return line extending between said reservoir and said jack unit through which fluid is discharged from said jack unit;

a change-over valve for selectively connecting one of said delivery line and said return line with said jack unit;

a relief line branching from said delivery line and communicating with said fluid reservoir; and

a relief valve including means for detecting when said change-over valve is set to a position for fluid to be delivered to said jack unit and means for detecting of the pressure within said jack unit has reached a predetermined level, said relief valve being provided in said relief line for bringing said source of fluid under pressure into communication with said reservoir when the fluid within said jack unit reaches said predetermined pressure level.

5,181,697

IMPACT MEMBER WITH MULTIPLE CONCENTRIC GAS CUSHIONS INFLATED IN SEQUENCE

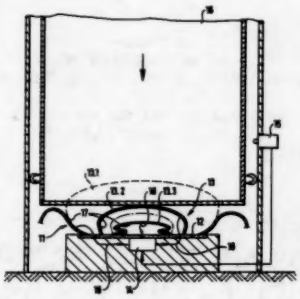
Klaus Rumer, Heitersheim, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuernberg, Fed. Rep. of Germany

Filed Apr. 8, 1991, Ser. No. 681,952

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1990, 4013868

Int. Cl.[5] F16F *9/04;* **B60R** *19/20, 21/24;* **B66B** *5/28*

U.S. Cl. 267—116 **4 Claims**



1. Impact member comprising at least two gas cushions which are arranged with in each other so as to constitute an outer cushion and at least one inner cushion; a triggering sensor for sequentially inflating said gas cushions, said at least two gas cushions jointly including a single time-delay triggering device which is connected to an output of said triggering sensor; a single mounting support on which said gas cushion are concentrically arranged in a flat folder arrangement within each other, said outer gas cushion being activated for inflation thereof prior to the inflation of said at least one inner gas cushion which is arranged therein.

5,181,698

HYDRAULICALLY DAMPING RUBBER BEARING

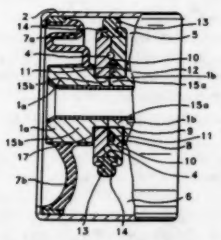
Rüdiger Fiene, Bad Godesberg, and Wilhelm Mayerböck, Kirchdaun, both of Fed. Rep. of Germany, assignors to BOGE Aktiengesellshaft, Eitorf, Fed. Rep. of Germany

Filed Jan. 23, 1992, Ser. No. 824,068

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1991, 4103012

Int. Cl.[5] F16F *13/00*

U.S. Cl. 267—140.12 **20 Claims**



1. Hydraulically damping elastomeric bearing comprising;

an outer member for encasing said bearing;

an inner member for being disposed within said outer member;

a resilient member means for retaining said inner member in said outer member;

at least two chambers comprising first and second chambers said first chamber and said second chamber disposed between said inner member and said outer member;

a component disposed about said inner member, said component comprising a throttle passage, said throttle passage connected between said first and said second chambers for allowing passage of damping fluid between said first and said second chamber; and

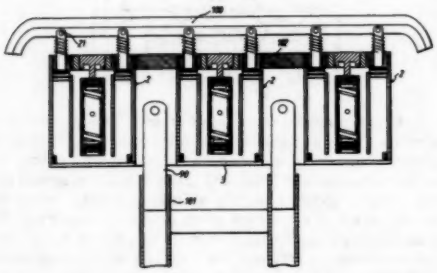
said component comprising two separate parts for dividing said component into substantial portions such that insertion of said component into said inner member is facilitated.

5,181,699

IMPACT ABSORBER

Chu Chang, No. 165, Sec. 2, Sungkiang Rd., Taitung City, Taiwan

Filed Mar. 11, 1992, Ser. No. 849,583
Int. Cl.[5] B60G *13/08*
U.S. Cl. 267—221 **3 Claims**



1. An impact absorber comprising:

a housing;

a pair of cylinders arranged in said housing and having a closure at one end thereof and a closed end, a piston arranged in each of the pair of cylinders for relative sliding movement within each of the pair of cylinders, a piston rod connected to the piston and extending through the cylinder closure to the exterior of the cylinder and said housing; and

a third cylinder provided with an opening at each of its ends, two pistons arranged for relative sliding movement within the third cylinder, spring means arranged axially between the two pistons in the third cylinder, the spring means having one end engaged with one of the two pistons and the other end engaged with the other of the two pistons, characterized in that

said pair of cylinders are parallel and separated from each other, a first aperture formed through the walls of each of said pair of cylinders facing each other adjacent said closure end, a second aperture formed through the walls of each of said pair of cylinders facing each other adjacent said closed end,

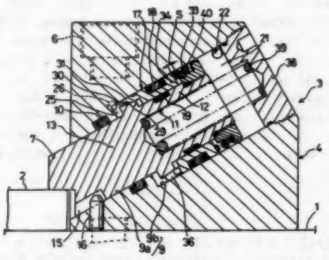
said third cylinder being parallelly arranged between said pair of cylinders such that a first gap is defined by the walls of one of said pair of cylinders, said third cylinder and said housing, and a second gap is defined by the walls of the other of said pair of cylinders, said third cylinder and said housing, said first gap and second gap each communicating with said third cylinder through said openings, with said pair of cylinders through said first aperture and said second aperture of said pair of cylinders.

5,181,700

CLAMPING APPARATUS

Keitaro Yonezawa, Kobe, Japan, assignor to Kabushiki Kaisha KOSMEK, Hyogo, Japan

Filed Apr. 3, 1992, Ser. No. 862,725
Claims priority, application Japan, Apr. 12, 1991, 3-108531
Int. Cl.[5] B23Q *3/08*
U.S. Cl. 269—24 **7 Claims**



1. A clamping apparatus comprising:

a housing having a first end and a second end, said housing having a cylinder bore extending between said first and second ends;

a first piston for clamping a workpiece, said first piston having an unlocking portion, and a second piston for locking said first piston in a clamping position, said second piston being concentrically mounted with respect to a portion of said first piston such that said first and second pistons are coaxial within said cylinder bore so as to be hermetically slidable within said bore between said first and second ends;

a first actuation chamber located within said bore between said second end of said housing and said first and second pistons;

a clamping member connected to a first end portion of said first piston;

a second actuation chamber located between said first end of said housing and said second piston;

a clamp wedge surface located on an outer circumferential portion of saidd first piston, said wedge surface being tapered in a direction away from said clamping member;

a locking wedge carried by said second piston for engaging said wedge surface in a direction toward said clamping member under the influence of fluid introduced into said first actuation chamber;

and an engaging portion carried by said second piston for engagement with said unlocking portion on said first piston through the introduction of fluid into said second actuation chamber, whereby said locking wedge is disengaged from said wedge surface to allow said first piston to retract from said clamping position.

5,181,701

HYDRAULIC CLAMP

Keitaro Yonezawa, Kobe, Japan, assignor to Kabushiki Kaisha KOSMEK, Hyogo, Japan

Filed Feb. 21, 1992, Ser. No. 838,683
Claims priority, application Japan, Feb. 22, 1991, 3-77395
Int. Cl.[5] B23Q *3/08*
U.S. Cl. 269—32 **5 Claims**

1. A hydraulic clamp comprising:

a clamp housing (2) having a front portion and a rear portion;

a guide bore (16) formed in the front portion of said clamp housing (2), said guide bore sloping rearwardly and upwardly from the front portion of said clamp housing;

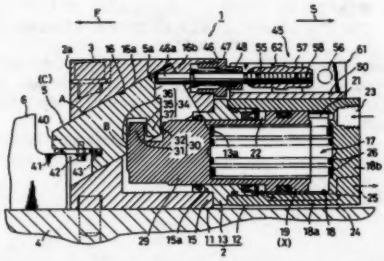
a clamping member (5) having a driven portion (34) and being shiftably mounted within said guide bore (16);

a hydraulic cylinder (17) having a cylinder bore (18) formed

generally horizontally in the rear portion of said clamp housing (2) and opening into said guide bore (16);

a piston (19) shiftably mounted within said cylinder bore (18); and

a push/pull drive portion (30) disposed before said piston (19) so as to be connected to said piston (19);



said driven portion (34) of said clamping member (5) being interconnected with said push/pull drive portion (30) with a vertical gap therebetween such that when said push/pull drive portion is shifted with said piston within said cylinder bore, said push/pull drive portion (30) will force said clamping member (5) to shift in an inclined direction within said guide bore by the interconnection of said driven portion (34) with said push/pull drive portion (30).

5,181,702

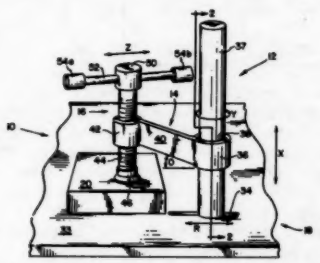
WORKPIECE HOLDDOWN DEVICE

Dennis K. Pettigrew, 7725 CR,32, Butler, Ind. 46721

Filed Jan. 6, 1992, Ser. No. 818,639

Int. Cl.[5] B23Q *3/02*

U.S. Cl. 269—93 **12 Claims**



1. A workpiece holddown device for retaining a workpiece onto a work surface having an opening therein, the holddown device comprising:

a cylindrical post having a longitudinal axis and removably mounted to the work surface adjacently over said opening;

mounting means for securing said cylindrical post to said work surface;

an arm assembly having on one end thereof a sleeve radially surrounding said cylindrical post and on another end thereof screw means, said sleeve being continuously rotatable about said cylindrical post through 360° and axially slidable on said cylindrical post, said arm assembly extending radially outwardly from said cylindrical post;

said screw means disposed on said arm assembly distal said cylindrical post for clampingly holding the workpiece against the work surface, said screw means creating a moment about said arm assembly to bind said arm assembly to said cylindrical post when said screw means is tightened on the workpiece, wherein said sleeve is tilted relative to said cylindrical post when said screw means is tightened against the workpiece thereby creating a friction bind between said sleeve and said cylindrical post such that said sleeve will not axially slide on or rotate about said cylindrical post.

5,181,703

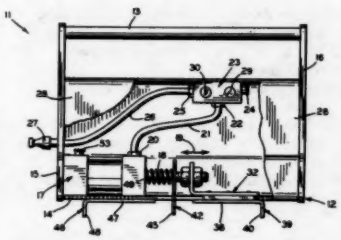
APPARATUS FOR INSTALLING WOODEN DECKING

Donald C. Gilstad, 117 S. 51st St., Omaha, Nebr. 68124, and Dennis J. Gilstad, 7255 E. Baldwin Rd., Grand Blanc, Mich. 48439

Filed Feb. 27, 1992, Ser. No. 843,576

Int. Cl.[5] B25B *1/20*

U.S. Cl. 269—43 **20 Claims**



1. An apparatus for installing wooden deck planks on a supporting frame of joists comprising:

a base formed as a generally rectangular plate and including a pair of end plates attached at lower ends thereof to opposed shorter edges of said base plate and a handle attached to and extending between upper ends of said end plates;

an actuator mounted on said base and having output means for movement between an open position and a closed position;

a generally inverted V-shaped cover extending between and attached to said end plates and attached to opposed longer edges of said base plate, said cover enclosing said actuator and spaced from said handle;

a fixed clamp mounted on said base for engagement with an edge of a deck plank;

a sliding clamp attached to said actuator output means for engagement with an edge of a deck plank, said sliding clamp being spaced from said fixed clamp by a predetermined distance exceeding the width of two adjacent deck planks when said actuator output means is in the open position; and

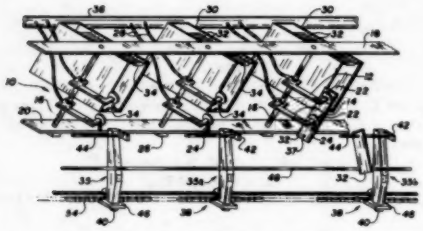
a spacer slidably mounted on said base between said fixed clamp and said sliding clamp and having a predetermined thickness corresponding to a desired spacing between two adjacent deck planks whereby when said actuator output means is in the open position, said base can be rested on an upper surface of a first deck plank attached to a deck frame and an upper surface of a second unattached deck plank with said fixed clamp engaging an opposite edge of the first deck plank and said spacer extending between facing edges of the first and second deck planks and when said actuator output means is moved toward the closed position, said sliding clamp engages an opposite edge of the second plank and said spacer abuts the facing edges of the first and second planks.

5,181,704

SAMPLE COLLATOR DEVICE WITH SAMPLES GATHERED ON PINS

William J. Roblin, North Royalton, Ohio, assignor to Dorn Color, Inc., Cleveland, Ohio

Filed Jul. 23, 1991, Ser. No. 734,556
Int. Cl.[5] B65H *39/02*
U.S. Cl. 270—54 **22 Claims**



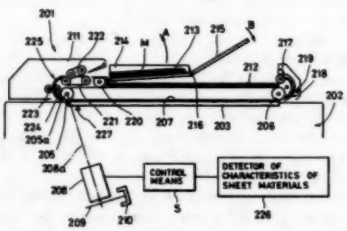
1. A collator device for samples comprising a revolving carousel that includes:
storage means for hole-containing samples;
sample selection means;
pin-containing sample transport means; and
motor means,
wherein hole-containing samples are removed from said storage means by said sample selection means and gathered in collated sequence on pins attached to said transport means which is moved around said carousel by said motor means.

5,181,705

SHEET DISCHARGING DEVICE THAT CHOOSES A SHEET DISCHARGING SPEED ACCORDING TO THE SHEET'S LENGTH OR RIGIDITY

Noriyoshi Ueda, Yokohama; Yuji Takahashi, and Makoto Kitahara, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1989, Ser. No. 370,907
Claims priority, application Japan, Jun. 23, 1988, 63-156448; Aug. 12, 1988, 63-201084; Sep. 29, 1988, 63-242390
Int. Cl.[5] G65H *43/00*
U.S. Cl. 271—3 **70 Claims**



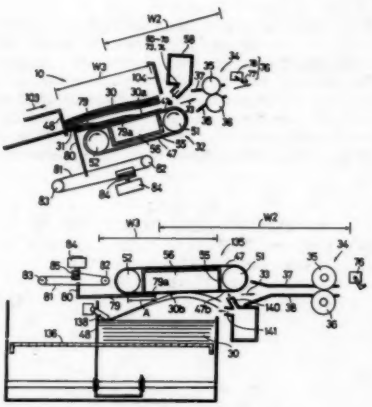
1. An image reading device comprising, means for forwarding originals, image reading means for reading images on the originals forwarded by said forwarding means, means for discharging the originals the images on which were read by said reading means, an original support for receiving originals discharged by said discharging means, a detector for detecting the length of an original to be discharged by said discharging means and for transmitting a detection signal and means for controlling said discharging means according to the detection signal sent by said detector, wherein said controlling means is constructed and arranged to control said discharging means at least a first discharging speed, a second discharging speed which is lower than the first discharging speed, and a third discharging speed which is lower than the second discharging speed.

5,181,706

SHEET FEEDING APPARATUS THAT USES A VARIABLE VACUUM SURFACE AND TIMER TO ACHIEVE A DUPLICATE FEED PREVENTIVE FUNCTION

Hiranaga Yamamoto, Yamatokooriyama; Souichi Takata, Shiki; Osamu Wakuda, Yamatotakada, and Toyoaki Namba, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 20, 1991, Ser. No. 672,652
Claims priority, application Japan, Mar. 20, 1990, 2-70916
Int. Cl.[5] B65H *5/08, 3/08, 3/34*
U.S. Cl. 271—11 **8 Claims**



1. A sheet feeding apparatus comprising:
(a) a laying plate for receiving a stack of a plurality of sheets,
(b) first feeding means for feeding a sheet to be fed from the stack, the feeding means located adjacent to the sheet to be fed, and downstream in a feeding direction from the laying plate, the first feeding means comprising:
(i) a feeding stretch belt for receiving the sheet to be fed and for providing the feeding surface, the belt extending downstream from the laying plate and
(ii) means for driving the belt operatively connected to the belt,
(c) a second feeding means for receiving individual sheets from the first feeding means, the second feeding means being downstream from the first feeding means,
(d) a stopping means for stopping the means for driving the belt,
(e) a cover member, covering an upstream region of the feeding surface, the region being adjustable lengthwise in the feeding direction of the feeding surface of the belt of the first feeding means so as to be able to adjust the length of the region in the feed direction,
(f) means for providing activation of the stopping means comprising a timer for providing an output based upon a predetermined time interval from the start of feeding of a first sheet to be feed from the stack of sheets by the first feeding means until the end of feeding of the same sheet by the second feeding means and whereby the stopping means stops the driving means of the first feeding means in response to the output of the timer and the predetermined time is based upon the length of the sheet whereby a

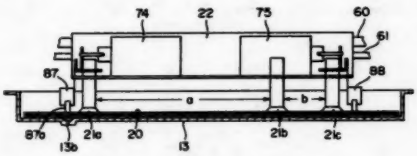
simultaneous feed of a plurality of sheets by the belt is prevented.

5,181,707

SHEET HANDLING APPARATUS PROVIDED WITH A SHEET SUCKING UNIT

Hajime Takei; Yukiyoshi Yamakoshi; Naoyuki Matsuda; Fuminori Moro; Hiroshi Tomita, and Homare Sano, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 19, 1990, Ser. No. 615,360
Claims priority, application Japan, Nov. 22, 1989, 1-303809
Int. Cl.[5] B65H *3/30*
U.S. Cl. 271—20 **12 Claims**



1. A sheet handling apparatus, comprising:
a sheet storing unit in which sheets are stacked;
means for sucking up a sheet from the sheet storing unit;
drive means for relatively moving the sucking means to the sheet storing unit;
first and second detecting means operatively connected to the sucking means for generating detecting signals;
first judging means for judging form the detecting signal generated by the first detecting means whether the sucking means comes to a set position inside the sheet storing unit;
means for stopping the drive means from moving the sucking means when the first judging means judges that the sucking means comes to the set position; and
second judging means for judging form the detecting signal generated by the second detecting means whether there is a sheet in the sheet storing unit, said second judging means being activated after the stopping means stops the drive means.

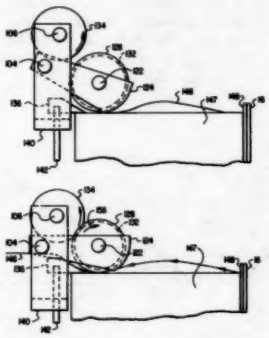
5,181,708

METHOD AND APPARATUS FOR SELECTING A SINGLE SHEET OF PAPER FROM A PAPER TRAY

Mark H. Ruch, Spring, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Jul. 20, 1990, Ser. No. 556,944
Int. Cl.[5] B65H *3/00*
U.S. Cl. 271—21 **18 Claims**

1. A mechanism for removing a sheet from a stack of sheets comprising:
means for moving a selected sheet in a first direction to separate said said selected sheet from the stack, said means for moving including a foot being adapted to pivot upward in response to said foot contacting said selected sheet as said mechanism moves downward along a preselected vertical path, said foot being adapted to move said selected sheet in said first direction as said foot pivots;
means for preventing movement of unselected sheets within the stack; and



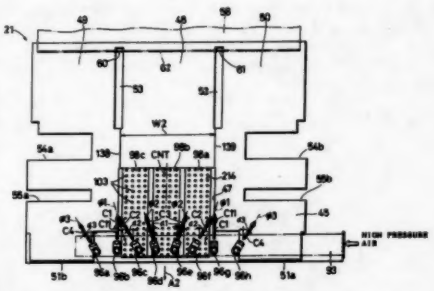
means for removing said selected sheet from the stack by moving said selected sheet in a second direction different from said first direction.

5,181,709

SHEET FEEDING APPARATUS

Kenji Okada, Ikoma, and Toyoaki Namba, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 20, 1991, Ser. No. 672,708
Claims priority, application Japan, Mar. 20, 1990, 2-70917
Int. Cl.[5] B65H *3/14*
U.S. Cl. 271—97 **41 Claims**

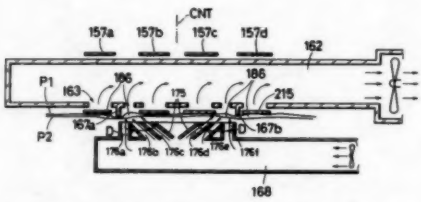


1. A sheet feeding apparatus comprising:
(a) a laying plate having a centerline running in a feeding direction for receiving a stack of sheets,
(b) a feeding means for feeding a sheet to be fed from the stack, the feeding means located adjacent to the position of the sheet to be fed and
(c) an air stream forming means disposed at the downstream side in the feeding direction for injecting a plurality of air flows between the sheets from plural positions in directions directed outwardly from the centerline of the laying plate and in directions toward the feeding means and in directions toward the position of sheets in the laying plate, the air flows between the sheets being concentrated at the upstream side in the feeding direction of the sheets.

5,181,710
TOP SHEET FEEDING APPARATUS

Souichi Takata, Shiki; Toyoaki Namba, Nara; Kenji Okada, Ikoma, and Osamu Wakuda, Yamatotakada, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 20, 1991, Ser. No. 672,654
Claims priority, application Japan, Mar. 20, 1990, 2-70918
Int. Cl.[5] B65H *37/14*
U.S. Cl. 271—98 11 Claims



1. A top sheet feeding apparatus comprising:

(a) a laying plate for receiving a stack of a plurality of individual sheets,

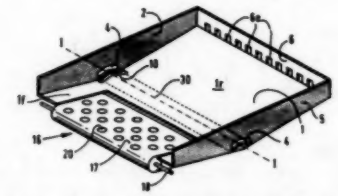
(b) a feeding means for vacuum feeding in a sheet feeding direction a top sheet from the stack to a feeding surface for receiving the top sheet, the feeding surface being above the top sheet and adjacent the position of the top sheet, the feeding means providing negative pressure at plural positions in a widthwise direction of the top sheet and partially deforming a portion of the top sheet in an upward direction and

(c) air stream forming means for injecting and forming a plurality of air flows toward the feed surface adjacent to the partially deformed portion of the top sheet, the air flows comprising air flows directed outwardly from the centerline of the laying plate and air flows directed in a direction partially opposed to the feeding direction.

5,181,711
DEVICE FOR DISCHARGING SHEETS FROM THE BOTTOM OF A STACK

Christophorus L. Spoorenberg, Nuenen, Netherlands, assignor to Oce-Nederland, B.V., Venlo, Netherlands

Filed Sep. 27, 1991, Ser. No. 766,138
Claims priority, application Netherlands, Sep. 28, 1990, 9002121
Int. Cl.[5] B65H *3/14, 3/46*
U.S. Cl. 271—98 15 Claims

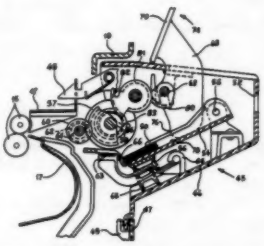


1. A holder for receiving sheets and discharging sheets therefrom one-by-one from the bottom of a stack of sheets which comprises a carrier having a rear portion, an intermediate portion and a front portion, together providing a carrier surface for said sheets, said carrier being bent at said intermediate portion thereof, transverse to a direction of conveyance of said sheets, so as to create a deepened section between said rear portion and said front portion, lateral supports extending from lateral edges of said carrier, at least one elevated part in said deepened section at said intermediate portion extending transverse to said direction of conveyance on said carrier surface of said carrier, at least one aperture provided in said carrier surface near at least one of said lateral supports juxtapositioned to said deepened section of said carrier and said elevated part, beneath at least one edge area at a side of said stack of sheets accommodated in said holder, such that a partial vacuum can be produced by way of said at least one aperture beneath said sheets using a vacuum means, means for introducing and blowing air across said deepened section of said carrier against at least one side of said stack of sheets whereby an air layer is created between at least the bottom sheet in said stack of sheets and the remaining sheets in said stack so as to substantially separate said bottom sheet from said remaining sheets in said stack of sheets and a transport means for discharging said bottom sheet.

5,181,712
SHEET FEEDING DEVICE HAVING THE ABILITY TO BACK A SHEET INTO THE SHEET SUPPLY TRAY

Andrea Perino, Cuorgne', Italy, assignor to Olivetti-Canon Industriale S.p.A., Ivrea, Italy

Filed Nov. 26, 1991, Ser. No. 798,101
Claims priority, application Italy, Dec. 10, 1990, 67987 A/90
Int. Cl.[5] B65H *3/06, 3/52*
U.S. Cl. 271—109 7 Claims



1. A device for the introduction of sheets into a machine for the reproduction or printing of documents, comprising:

a tray for holding a stack of sheets;

a shaft rotatable in a first direction;

a driving means operable to rotate said shaft in said first direction;

a feeding roll mounted on said shaft and disposed for contact with a top sheet of said stack to separate the sheets from the tray and to introduce them into said machine;

a block cooperating with said roll to keep back possible second sheets;

a lever movable from a rest position to a functional position; and,

a kinematic chain for connecting said lever to said roll in order to rotate the roll in an opposite direction to said first direction, when said lever is rotated to said functional position, so as to move back sheets held between said roll and said block.

5,181,713
PAPER TRAY FOR A COPYING MACHINE

Alfred Neugebauer, Stuttgart, Fed. Rep. of Germany, assignor to Develop Dr. Eisbein GmbH & Co., Fed. Rep. of Germany

Filed Aug. 27, 1991, Ser. No. 750,539
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1990, 9012932
Int. Cl.[5] B65H *1/12*
U.S. Cl. 271—160 19 Claims

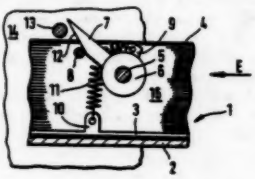
1. A paper tray arrangement for receiving a stack of paper and which is insertable into a receiving device of a copying machine, comprising:

a supporting plate for the stack of paper,

at least one spring applied directly to the supporting plate to lift the supporting plate off the bottom of the tray,

tensioning apparatus for the at least one spring,

and a stop on the receiving device engageable with the



tensioning apparatus in such a manner that the spring is progressively tensioned only when the paper tray is inserted into the receiving device and is progressively relaxed only when the paper tray is taken out of the receiving device.

5,181,714

DOCUMENT FEEDER WITH ADJUSTABLE LENGTH DOCUMENT REVERSING TRANSPORT PATH

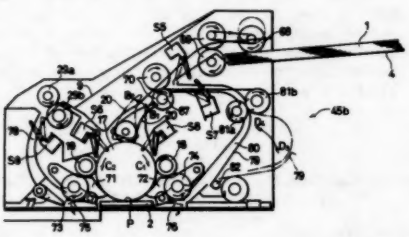
Toshio Yamagishi, Nara; Youichi Kimura, Nabari; Tamotsu Shuto, Kashihara, and Tatuya Ito, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 22, 1991, Ser. No. 796,351

Claims priority, application Japan, Nov. 26, 1990, 2-321711; Mar. 25, 1991, 3-060199; Jul. 8, 1991, 3-167176

Int. Cl.[5] B65H *29/00*

U.S. Cl. 271—186 **5 Claims**



1. A document feeder for feeding documents to a document scanning section where an image of each document is scanned, comprising:

first fed means for feeding the document to the document scanning section;

transport means for transporting the document from the scanning section to a transport path;

reversing means for turning over the document transported by said transport means;

second feed means for feeding to the document scanning section the document that has been turned over by said reversing means; and

length adjusting means for adjusting a length of an actual document transport course of said transport path depending on the size of the document.

said length adjusting means being comprised of a reversing guide member forming an outer wall of said transport path and a pivotal shaft secured to one end of said reversing guide member, said reversing guide member being freely rotatable on said pivotal shaft to open said transport path.

5,181,715

SHEET CONVEYING UNIT AND SYSTEM USING THE SAME

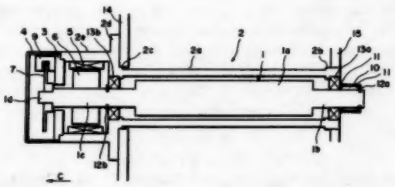
Keiji Ohkoda; Tomohiro Kudo; Satoshi Shimizu, all of Yokohama, and Keiichi Kawasaki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 618,510, Nov. 27, 1990, abandoned. This application Apr. 24, 1992, Ser. No. 873,899

Claims priority, application Japan, Dec. 15, 1989, 1-325007

Int. Cl.[5] B65H *5/06*

U.S. Cl. 271—272 **16 Claims**



1. A sheet conveying unit to be detachably mounted to an apparatus for recording images on a sheet and/or for reading images from a sheet, comprising:

a rotary shaft,

a roller mounted on said rotary shaft for conveying the sheet coming into contact therewith;

a drive motor, including a rotor and a stator, for rotatively driving said rotary shaft, with said rotor being mounted on one end of said rotary shaft; and

a bearing for rotatably supporting the other end of said rotary shaft.

5,181,716

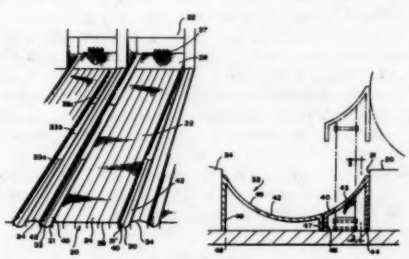
BOWLING ALLEY BUMPER SYSTEM

Michael W. Stephens, Richmond, Va., assignor to AMF Bowling, Inc., Richmond, Va.

Filed Mar. 3, 1992, Ser. No. 845,035

Int. Cl.[5] A63D *5/00*

U.S. Cl. 273—51 **5 Claims**



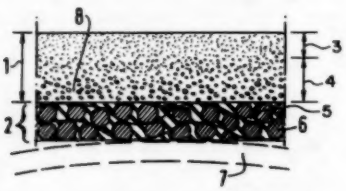
1. A bumper bowling system comprising a series of cross supports and a bowling alley disposed on said series of cross supports, said bowling alley having two sides and a longitudinally extending lane having a major axis on an upper surface of said alley, said lane having a foul line at one end and a pin deck at the other end thereof, a pair of elongated concave gutters extending along and substantially abutting the sides of said lane between the ends thereof for receiving a bowling ball which falls off of said lane, each of said gutters having first and second separate longitudinally extending portions with each of said portions having a major axis parallel to the axis of said lane, each of said portions including means defining an arc-shaped segment with a first downwardly extending projection which extends downwardly with respect to said alley, a second downwardly extending portion which is parallel with said first

downwardly extending projection, extending and retracting means for moving each of said portions of each of said gutters upwardly with respect to said alley into an extended position to thereby prevent a bowling ball from falling into one of said gutters and downwardly into a retracted position which allows bowling balls to roll into and along said one of said gutters and each of said extending and retracting means including a pair of swivel joints and an arm connecting said swivel joints and wherein a first of said swivel joints is operatively connected to said portion and the second of said swivel joints is operatively connected to one of said cross supports, said longitudinally extending portions lie on an x axis with a y axis laterally thereof and a z or vertical axis and wherein said extending and retracting means moves each of said portions including said downwardly extending projections an equal distance upwardly and downwardly along an arc in the xz plane without any substantial lateral movement along the y axis.

5,181,717
INFLATED SPORTS BALL

Jean-Marie Donntag, Kehl, and Jacques Casper, Gottenhouse, both of France, assignors to Adidas Sarragan France, Landersheim, France

Filed Mar. 2, 1990, Ser. No. 488,284
Claims priority, application France, Mar. 3, 1989, 89 02828
Int. Cl.[5] A63B *41/08*
U.S. Cl. 273—58 BA **12 Claims**



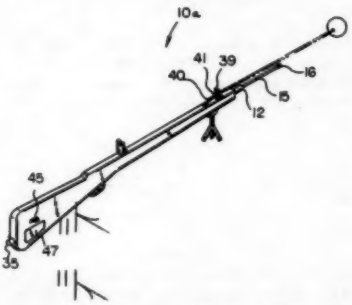
1. An inflated bladder-type sports ball, comprising:
wall means defining an inflated bladder having an external surface;
a cover supported on said external surface and enclosing said inflated bladder; said cover comprising a layer of synthetic plastic material having a substantially uniform thickness, said layer including an inner core portion which is foamed, and an external skin, integrally provided on said core portion, said skin being substantially non-foamed;
said synthetic plastic material of core portion and skin being made of polyurethane or a copolymer of polyurethane and polyurea;
said layer as a whole being between 1.5 and 5 mm thick, said core portion being between 1.0 and 3.0 mm thick and said skin being between 0.5 and 2 mm thick.

5,181,718
POOL STICK APPARATUS

Douglas H. Valentine, P.O. Box 261 Redondo La., Templeton, Calif. 93465

Filed Dec. 5, 1991, Ser. No. 802,543
Int. Cl.[5] A63D *15/08*
U.S. Cl. 273—69 **5 Claims**

1. A pool stick apparatus, comprising,
an elongate rifle stock, the rifle stock including a front end wall and a rear end wall, the front end wall including a cylindrical guide bushing projecting forwardly of the front end wall, and
a cylindrical first bore in communication with the cylindrical guide bushing coaxially aligned therewith, and a cylindrical second bore projecting rearwardly of the cylindrical first bore in communication therewith, wherein the cylindrical second bore is defined by a second diameter greater than first diameter defined by the first bore, and
a cylindrical cue rod slidably mounted within the first bore and the second bore, and
a rear plate fixedly and orthogonally mounted to a rear distal end of the cue rod, with the rear plate positioned within the second bore, the second bore including a second bore rear wall and a second bore front wall, and
an actuator spring captured between the rear plate and the second bore rear wall, and
the cue rod including a forward tip mounted to a forward distal end of the cue rod positioned exteriorly of the guide bushing, and



a trigger pivotally mounted within a housing below the first bore, and a key way slot in contiguous communication with the first bore, and a cue rod lug fixedly mounted to the cue rod positioned within the key way slot, the trigger pivotally mounted about a pivot axle, the pivot axle pivotally mounted to the housing, and a latch pin, the latch pin including a latch pin axle, the latch pin axle mounted within the trigger forwardly of the pivot axle, and the latch pin slidably mounted within the housing orthogonally oriented relative to the cue rod, the latch pin arranged for engagement with the cue rod lug, whereupon pivoting of the trigger effects displacement of the latch pin relative to the cue rod lug permitting projection of the cue rod forwardly of the guide bushing.

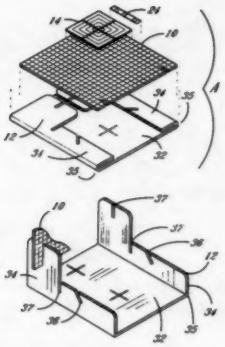
5,181,719
TARGET

Novie P. Cleveland, III, 433 Rotterdam Rd., Easley, S.C. 29640

Filed Oct. 21, 1991, Ser. No. 779,807
Int. Cl.[5] F41J *1/00*
U.S. Cl. 273—409 **25 Claims**

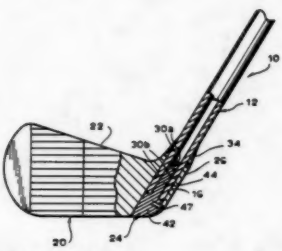
1. A targeting arrangement comprising:
a target surface;
a laminated sheet comprising;
a plurality of progressively sized die-cut concentric sighting frames which have an adhesive on one surface thereof and are adapted to be selectively removed and secured to said target surface;
each said sighting frame consists of a dark colored border area having inner and outer edges, said inner edges forming a square open center of a selected size and said outer edges forming the perimeter of said frame;
said target surface consisting of a self-supporting substantially rigid sheet with one surface having a contrasting background with a plurality of vertical and horizontal grid lines arranged thereon forming equal sized squares over the entire said one surface, said grid lines being of a color corresponding to said dark color and said sighting frames and being of a size which allows one of said inner and outer edges to be aligned with said vertical and horizontal grid lines, whereby;
when a selected sighting frame is secured to said one surface

a vertical grid line is aligned with a pair of vertical edges of said sighting frame and a horizontal grid line is aligned



with a pair of horizontal edges of said sighting frame creating a precise sight picture.

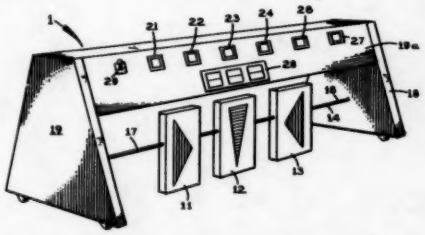
5,181,720
GOLF CLUB CONSTRUCTION
John T. Stites, III, and Jerome M. Austry, both of Fort Worth, Tex., assignors to Head Sports, Inc., Fort Worth, Tex.
Continuation-in-part of Ser. No. 692,170, Apr. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 525,879, May 17, 1990, abandoned. This application Dec. 12, 1991, Ser. No. 807,403
Int. Cl.[5] A63B *53/02*
U.S. Cl. 273—80.2 **40 Claims**



1. A golf club comprising:
(A) a club shaft having a grip end and an opposed hollow end;
(B) a club head having a body, a male pin and a female hosel disposed about said pin, said pin and said hosel together defining an annulus therebetween configured and dimensioned to receive therein said hollow shaft end; and
(C) adhesive means disposed both in a first bond line intermediate the inner surface of said hollow shaft end and the outer surface of said pin and in a second bond line intermediate the outer surface of said hollow shaft end and the inner surface of said hosel.

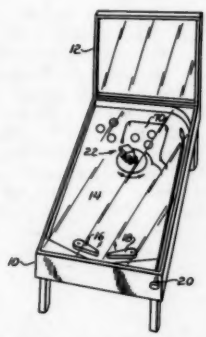
5,181,721
GOLF GAME APPARATUS
Ronald Halliburton, Boca Raton, Fla., assignor to Jeron Technology, Inc., Pompano Beach, Fla.
Filed Apr. 26, 1991, Ser. No. 691,731
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—177 A **19 Claims**

1. A golf game apparatus comprising at least three rotatable targets activated by a golf ball, horizontal supporting means for rotatably supporting said targets, wherein each target has a rest position presenting a forward-facing target surface in said rest position; rotation-detecting means coupled to each target, computing means coupled to said rotation-detecting means for computing game-related parameters, and display means for



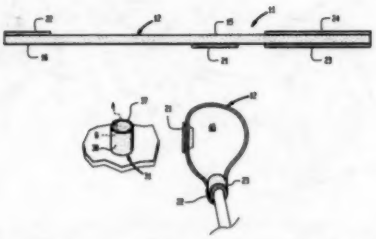
displaying said parameters; a light-reflecting area on said rotating targets; a light source for illuminating said reflecting area; and a light sensor for sensing reflected light from said reflecting area coupled to said computing means for indicating rotation of said rotatable targets.

5,181,722
MOVABLE OPTICAL TARGET BANK FOR A ROLLING BALL GAME
John R. Krutsch, Glenview, and Manu Jayswal, Bloomingdale, both of Ill., assignors to William Electronics Games, Inc., Chicago, Ill.
Filed Mar. 6, 1992, Ser. No. 847,355
Int. Cl.[5] A63B *71/00*; **A63F** *7/30*
U.S. Cl. 273—127 B **11 Claims**



1. In a computer controlled rolling ball game including an inclined playfield, a ball and means for projecting the ball on the playfield, a playfield feature comprising:
(a) a table mounted flush to said playfield for rotation in an opening therein and on which said ball can roll;
(b) a target housing disposed on said table for movement therewith;
(c) optical emitter and sensor means associated with said playfield feature extending between said housing and said table for creating at least one optical beam which can be interrupted by said ball, said sensor means including means for signalling said computer when a beam is interrupted;
(d) means for rotating said table to change the position of the optical beam.

5,181,723
GOLF PRACTICE DEVICE
Russell M. Brown, 57 Washington St., Natick, Mass. 01760
Filed Mar. 5, 1992, Ser. No. 846,116
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—186.5 **18 Claims**

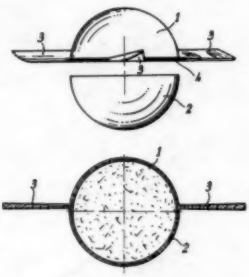


1. Golf practice apparatus for use with a golf club including an elongated shaft, a head portion defining a toe portion an object striking face, and a hosel portion joining said head portion to one end of said shaft; said apparatus comprising:

an accessory adapted to be removably attached to said golf club, said accessory comprising an elongated band having front and back surfaces, each having middle and first and second end portions; a face cover secured to said middle portion of said front surface between said first and second end portions, said face cover formed from a first material adapted to releasably interlock with a complementary second material on a simulated gold ball object struck thereby; first fastener means secured to said first end portion of said back surface, said first fastener means formed from a third material adapted to releasably interlock with a complementary fourth material; second fastener means secured to said second end portion of said front surface, said second fastener means formed from a fifth material adapted to releasably interlock with a complementary sixth material; and third fastener means secured to said second end portion of said back surface, said third fastener means formed from said sixth material, and said fourth material formed from said fifth or sixth material, the structural characteristics of said elongated band being such that said band is adapted to extend from it second end portion at said hosel portion where said fifth and sixth materials are interlocked around said hosel portion, across said striking face, around said toe portion, and back to its first end portion where said third material is interlocked with said fifth or sixth material, and said face cover overlies said striking face.

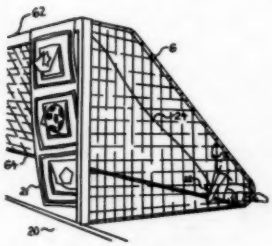
5,181,724
WING SHOOTING TARGET
Vittorio Spadoni, No. 11, Via Aristofane, App. 25, 00125 Roma, Italy
Filed Oct. 28, 1991, Ser. No. 781,801
Claims priority, application Italy, Oct. 30, 1990, 48422 A/90
Int. Cl.[5] F41J *9/16*
U.S. Cl. 273—363 **8 Claims**

1. A wing shooting target comprising a substantially spherical body with a hollow interior and a plurality of external radially extending vanes wherein the body comprises two



substantially hemispherical hollow parts connected together and wherein the interior of the body is under vacuum.

5,181,725
SOCCER SHOOTING TRAINING TARGET
Nicholas J. Leras, 163 Laurelwood La., Ormond Beach, Fla. 32174, and John P. Condorodis, 800 Marvin Rd., Ormond Beach, Fla. 32176
Filed Dec. 3, 1991, Ser. No. 801,883
Int. Cl.[5] A63B *63/00*
U.S. Cl. 273—402 **12 Claims**



1. A rectangular soccer shooting training target comprising a plurality of vertically disposed targets marked upon the front of said soccer shooting training target, each of said targets containing an aperture large enough to admit passage to a soccer ball, each of said targets containing a flap bearing markings, one edge of said flap being connected to the upper edge of one said aperture, said rectangular soccer shooting training target further comprising:

a horizontal sleeve at the top of said soccer shooting training target,

an upper rigid member disposed within said horizontal sleeve at the top of said soccer shooting training target,

a horizontal sleeve at the bottom of said soccer shooting training target,

a lower rigid member disposed within said horizontal sleeve at the bottom of said soccer shooting training target,

a plurality of batons disposed within horizontal sleeves along the height of said soccer shooting training target, said upper rigid member, said lower rigid member and said batons contributing to the horizontal rigidity of said soccer shooting training target, and

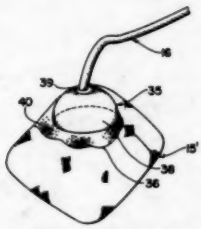
means to attach said soccer shooting training target to a soccer goal.

5,181,726

APPARATUS AND METHODS EMPLOYING ELASTIC CORDS WITH HAND BALLS

Gary D. Piaget, 1435 W. Silver Meadows Dr., Park City, Utah 84060

Filed Oct. 9, 1991, Ser. No. 773,451
Int. Cl.[5] A63B *67/10*
U.S. Cl. 273—414 14 Claims



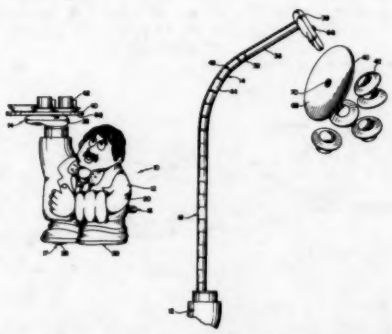
1. A ball system for use in a play activity that requires manipulation by a hand of a user, comprising a ball, an elastic cord, one end of which is interconnected to said ball, and a single loop finger band interconnected to the other end of said elastic cord and being mountable on a single finger of said user, wherein the palm of the hand of the user faces in the direction of the ball as interconnected to said cord, said single loop finger band having a width that extends over a relatively large surface area of said single finger, wherein impact forces affecting the single finger in the play activity of the ball system are distributed over a relatively large surface area of said single finger for preventing discomfort and irritation to said single finger, said elastic cord providing for return of said ball toward the palm of the user's hand after the ball is thrown by the user during the play activity thereof.

5,181,727

TOY GAME APPARATUS WITH VERTICALLY EXTENDABLE APPENDAGE

Satoshi Fukumura, Tokyo, Japan, assignor to Sente Creations Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1991, Ser. No. 761,275
Claims priority, application Japan, Sep. 17, 1990, 2-254408
Int. Cl.[5] A63F *9/00*; A63H *3/36*
U.S. Cl. 273—450 14 Claims



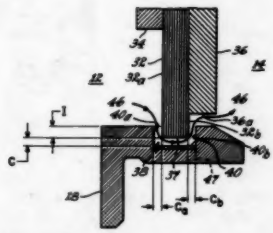
1. A toy game apparatus comprising a character figure body portion adapted to be received in a substantially upright disposition on a supporting surface, a substantially vertically disposed, extendable semi-rigid appendage on said character figure body portion, and manually controllable advancing means for selectively advancing said appendage from a retracted position substantially within said body portion to various different vertically extended positions relative thereto, said appendage being laterally bendable and collapsible in response to the application of a lateral bending force thereto, said appendage also being constructed such that it is vertically extendable to a point where it becomes sufficiently unstable to cause it to laterally collapse under its own weight.

5,181,728

TRENCHED BRUSH SEAL

Philip F. Stec, Medford, Mass., assignor to General Electric Company, Cincinnati, Ohio

Filed Sep. 23, 1991, Ser. No. 764,289
Int. Cl.[5] F16J *15/447*; F01D *11/02*
U.S. Cl. 277—53 9 Claims



1. A brush seal apparatus comprising:

brush seal means disposed between a high pressure zone and a lower pressure zone and fixedly attached to a first member; and

a second member having a groove means for receiving a compliant portion of said seal means therein in close proximity to and spaced from internal surfaces of said groove means for restricting fluid flow between said high pressure zone and said lower pressure zone, wherein said brush seal means comprises at least one annular brush seal having a centerpoint;

said seal compliant portion comprises free first ends of a plurality of bristle elements having second ends permanently attached to an annular ring of said brush seal; and

said groove means comprises at least one annular groove having an internal contour substantially complementary to an external contour of said seal compliant portion.

5,181,729

SEAL DEVICE

Alf Forssberg, Nykvan, and Boris Fredriksson, Huddinge, both of Sweden, assignors to ITT Flygt AB, Solna, Sweden

Filed Aug. 26, 1991, Ser. No. 749,796
Claims priority, application Sweden, Sep. 3, 1990, 9002791
Int. Cl.[5] F16J *15/34*
U.S. Cl. 277—62 4 Claims

1. A seal arrangement for a shaft connecting a driving unit to a hydraulic unit, the arrangement comprising in combination:

a first seal device having a first rotating seal ring (6) and a first stationary seal ring (7), with said first stationary seal ring being retained in a holder (10) in said driving unit,

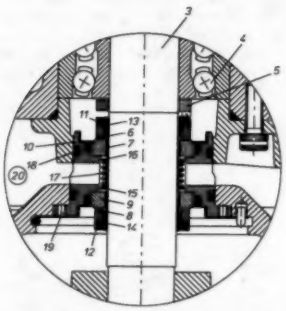
said first seal device having a first elastic holding ring (11) for rotatably mounting said first rotating seal ring (6) on said shaft, and

said first holding ring (11) having a first slotted socket member (13) forming fingers extending along said shaft beyond said first stationary seal ring (7) and forming at its extended end a first collar (15);

a second seal device axially displaced from said first seal device, said second seal device having a second rotating seal ring (8) and a second stationary seal ring (9), with said second stationary seal ring being retained in said holder (10) in aid driving unit,

said second rotating seal device having a second elastic holding ring (12) for rotatably mounting said second seal ring (8) on said shaft, and

said second holding ring (12) having a second slotted socket member (14) forming fingers extending along said shaft in an interlaced manner with said first socket member (13) toward said first seal device and forming at its extended end a second collar (16); and



a compression spring (17) arranged around said shaft and between said first collar (15) and second collar (16), whereby said first rotating seal ring (6), is pressed against said first stationary seal ring (7) and said second rotating seal ring (8) is pressed against said second stationary seal ring (9).

5,181,730

SEALING SYSTEM FOR ABUTTING TUBE ENDS IN A PIPE CONDUIT

Ole G. Hjertholm, Kokstad, Norway, assignor to Friele Trading A/S, Nesttun, Norway

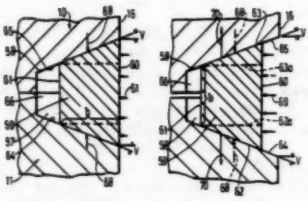
PCT No. PCT/NO89/00131, § 371 Date May 30, 1991, § 102(e) Date May 30, 1991, PCT Pub. No. WO90/07627, PCT Pub. Date Jul. 12, 1990

PCT Filed Dec. 14, 1989, Ser. No. 687,873

Claims priority, application Norway, Dec. 27, 1988, 885759

Int. Cl.[5] F16J *15/08*

U.S. Cl. 277—167.5 **20 Claims**



1. In combination

a pair of pipe-forming members disposed in axial relation, each of said members having an inner surface coextensive with an inner surface of the other of said members, a tapered sealing surface facing said tapered sealing surface of the other of said members, and a support surface abutting said support surface of the other of said members; and

a metal sealing ring disposed in sealing relation between said members, said sealing ring having an inner annular surface coextensive with said inner surfaces of said members, a pair of tapered sealing surfaces in sealing contact with said respective sealing surfaces of said members and an outer annular surface spaced radially inwardly of said abutting support surfaces whereby upon axial movement of said members away from each other, said sealing surfaces of said ring slide along said sealing surfaces of said members while maintaining sealing contact therebetween throughout the radial width of said ring.

5,181,731

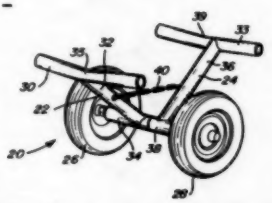
PIVOTABLE CART

Willard Gustavsen, 12142 Rangeline, Berrien Springs, Mich. 49103

Filed Aug. 30, 1991, Ser. No. 753,396

Int. Cl.[5] B62B *1/04*

U.S. Cl. 280—47.131 **4 Claims**



1. A cart comprising:

a first support member spaced from a second support member;

said first and second support members being supported by at least one wheel such that a member may be placed on said first and second support members in a use position and transported on said at least one wheel;

said first and second support members being spaced from each other in a use position by a first distance, and being movable towards each other to a storage position where they are spaced by a distance less than said first distance;

a pair of said wheels which are rotatable about a single axis, and said first and second support members pivot relative to each other about said axis to said storage position; and

said support members including a wheel bushing which receives a spacer, said spacer being force fit into the wheel bushing of said second support member, said spacer being freely rotatable within the wheel bushing of said first support member, and said spacer having threads at each end with said wheels being attached to said threads.

5,181,732

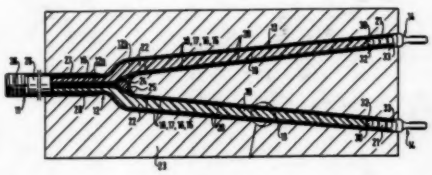
COMPOSITE BICYCLE FORK

Michel Bezin, Nevers, France, and Joris V. Raemdonck, Bazel, Belgium, assignors to Look S.A., Nevers Cedex, France

Division of Ser. No. 384,343, Jul. 24, 1989, Pat. No. 5,039,470. This application Apr. 30, 1991, Ser. No. 693,843

Int. Cl.[5] B62K *21/00*

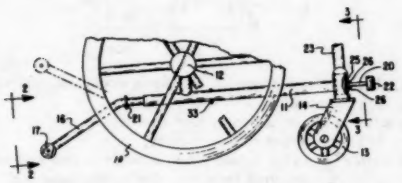
U.S. Cl. 280—279 **11 Claims**



1. A bicycle fork comprising a tubular steering spigot of metal, a fiber reinforced polymer fork head rotationally fixedly connected to the steering spigot, two elongate fiber reinforced polymer fork arms formed in one piece with the fork head; first and second axle mounts of metal each disposed at a free end of

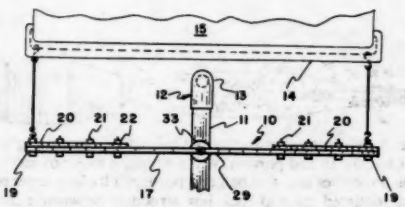
a respective one of said fork arms remote from said fork head, said axle mounts each having a respective connection spigot inserted in rotationally fixed manner into the free end of the respectively associated fork arm, and said connection spigots of the axle mounts having peripheral ribs and non-round cross-sections.

5,181,733
ANTI-TIP DEVICE FOR WHEELCHAIR
George E. Tague, 2900 Valley View Rd., Sioux Falls, S. Dak. 57106
Filed Dec. 13, 1991, Ser. No. 806,210
Int. Cl.[5] B62B *5/02*
U.S. Cl. 280—304 9 Claims



1. For use with a wheelchair adapted to roll on a surface and having a frame including a tubular lower rail, an anti-tipping device including an extension having one end rotatably and axially telescoped within said lower rail, said extension extending from a rear end of said lower rail, said extension being bent so that in a first position the end of said extension from said lower rail reaches a point near said surface, motion transmitting means for rotating and sliding said extension affixed to said extension, said motion transmitting means extending axially through said lower rail, and operating means for rotating and sliding said motion transmitting means connected to said motion transmitting means adjacent a front end of said lower rail whereby said extension can be moved rotatably to rotate said extension from the position with one end near the surface to a second position where that end is remote from said surface.

5,181,734
ADJUSTABLE GRAVEL SHIELD FOR A TOWED BOAT
Terry L. Brown, P.O. Box 9833, Amarillo, Tex. 79105
Filed Feb. 21, 1992, Ser. No. 838,824
Int. Cl.[5] B62D *25/16*
U.S. Cl. 280—414.1 5 Claims



1. A protective device for mounting to a trailer hitch disposed behind the rear bumper of a towing vehicle, said protective device comprising:

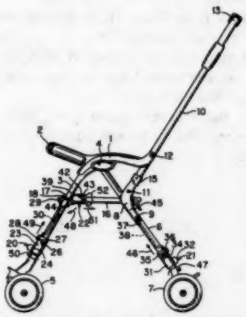
a) an elongated rigid support member having a midpoint and opposed lateral extremities equidistantly spaced from said midpoint,

b) paired resilient shield members pendantly held by said support member adjacent said lateral extremities and equidistantly spaced from said midpoint,

c) a mounting bracket configured to embrace a trailer hitch disposed in generally orthogonal relationship beneath said support member, said mounting bracket securing said support member in a manner permitting pivotal movement of said support member about its midpoint in a horizontal path above said trailer hitch, and

d) paired elastic tethers configured to extend between said lateral extremities and the rear bumper of said towing vehicle.

5,181,735
FOLDAWAY BABY CARRIAGE AND FOLDING MECHANISM EMPLOYED THEREIN
Ichiro Onishi, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan
Filed Dec. 27, 1991, Ser. No. 815,261
Claims priority, application Japan, Jan. 11, 1991, 3-2315
Int. Cl.[5] B62B *7/06*
U.S. Cl. 280—642 6 Claims



1. A foldaway baby carriage comprising members forming side surfaces of its frame and members extending across said members forming the side surfaces of said frame for defining the cross-directional size of said frame, wherein

said members forming the side surfaces include:

a pair of horizontally extending handrail members;

a pair of front legs having upper ends being rotatably coupled to relatively front portions of said handrail members and lower ends being connected with front wheels;

a pair of rear legs having upper ends being rotatably coupled to relatively front portions of said handrail members and lower ends being connected with rear wheels;

a pair of reversal members having first ends being coupled to longitudinal centers of said pair of rear legs to be rotatable about first pivotal points;

a pair of push rods having lower ends being rotatably coupled to second ends of said pair of reversal members, positions of said pair of reversal members upwardly separated from said lower ends by prescribed distances being rotatably coupled to rear ends of said pair of handrail members; and

a pair of side bars having front ends being coupled to longitudinal centers of said pair of front legs to be rotatable about second pivotal points and rear ends being rotatably coupled to second ends of said pair of reversal members,

said members defining the cross-directional size of said frame include:

a front leg coupling member extending across said pair of front legs in positions lower than said second pivotal points, and

a rear leg coupling member extending across said pair of rear legs in positions lower than said first pivotal points,

said front leg coupling member includes:

a pair of front leg sleeves being slidably mounted on said front legs to be rotatable about central axes of said front legs respectively, and

a bendable front leg coupling link coupling said pair of front leg sleeves with each other,

said front leg sleeves are provided with spirally extending guide grooves respectively,

said front legs are provided with guide pins being received in said guide grooves,

said side bars are provided with side bar extension parts frontwardly extending beyond said second pivotal points respectively,

said side bar extension parts and said front leg sleeves are coupled with each other by front leg rigid links respectively,

said rear leg coupling member includes:

a pair of rear leg sleeves being slidably mounted on said rear legs to be rotatable about central axes of said rear legs respectively; and

a bendable rear leg coupling link coupling said pair of rear leg sleeves with each other,

said rear leg sleeves are provided with spirally extending guide grooves,

said rear legs are provided with guide pins being received in said guide grooves respectively,

said reversal members are provided with reversal member extension parts extending beyond said first pivotal points toward said first ends, and

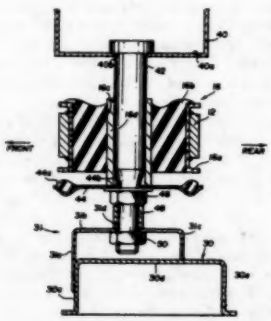
said reversal member extension parts and said rear leg sleeves are coupled with each other by rear leg rigid links respectively.

5,181,736

STRUCTURE FOR MOUNTING SUSPENSION UNIT ON VEHICLE BODY

Hitoshi Kokubun, Kanagawa Pref., Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Aug. 5, 1991, Ser. No. 740,559
Claims priority, application Japan, Aug. 8, 1990, 2-210730
Int. Cl.[5] B60G *11/42*
U.S. Cl. 280—719 **9 Claims**



1. A structure of a vehicle, comprising:

a cross member which constitutes a part of a vehicle body;

a suspension unit which has a supported portion and a transverse leaf spring;

a spring support member secured to the vehicle body, said spring support member being positioned below said cross member; and

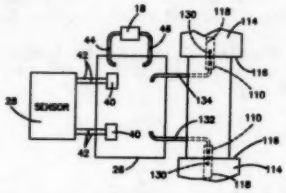
a suspension supporting bolt which has an upper end portion secured to said cross member, a lower end portion secured to said spring support member, and a middle portion secured to the supported portion of said suspension unit.

5,181,737

SAFETY APPARATUS FOR VEHICLE OCCUPANT

Reiner Lenzen, Almont; Ernst M. Faigle, Dryden, and John H. Semchena, Royal Oak, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Jul. 5, 1990, Ser. No. 548,134
Int. Cl.[5] B60R *21/22*
U.S. Cl. 280—732 **8 Claims**



1. A safety apparatus for a vehicle occupant, said safety apparatus comprising:

a housing having a deployment opening;

an inflatable airbag in said housing;

a source of gas for inflating said airbag to cause said airbag to move outwardly from said deployment opening;

a door having a closed position in which said door closes said deployment opening and an open position, said door having an edge surface and a first inner surface defining a first cavity which opens into said edge surface;

a door frame having a frame surface facing said edge surface of said door and a second inner surface defining a second cavity which opens into said frame surface;

a locking pin having a locked position extending partially into said first cavity and partially into said second cavity to lock said door in said closed position; and

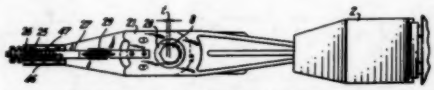
explosive means for driving said locking pin out of said locked position to release said door for movement from said closed position to said open position.

5,181,738

SEAT BELT WITH AN AUTOMATIC UNLOCKING DEVICE

Shigeichi Shimizu, 6-26-14 Yutakacho, Shinagawa-Ku, Tokyo, Japan

Filed Apr. 29, 1991, Ser. No. 692,423
Int. Cl.[5] B60R *21/00*
U.S. Cl. 280—801 **7 Claims**



1. A seat belt automatic unlocking device comprising a seat belt having an end portion with a fitting, a lock box structure which receives said seat belt end portion, a locking lever movably mounted on said lock box structure between a locked position and an unlocked position, said locking lever engaging and locking said fitting when in said locked position, said locking lever disengaging and unlocking said fitting when in said unlocked position to thereby unlock said seat belt, a mounting structure mounted on a vehicle on which the seat belt automatic unlocking device is used, connecting means connecting said mounting structure to said lock box structure, and releasable means operably connected between said mounting structure and said locking lever and operable between a release position and a non-release position, said releasable means being operable to move said locking lever to its unlocked position when said releasable means is moved to its

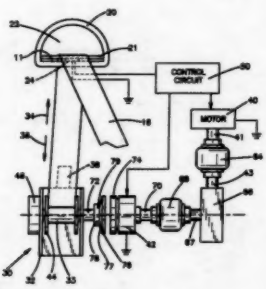
release position, said releasable means being operable to retain said locking lever in its locked position when said releasable means is in its non-release position, said releasable means comprising a rotatably mounted drum and a rotatably mounted pulley along with a rope means extending between said drum and said pulley, said pulley being rotatable by said rope to a position to effect release of said locking lever to its unlocked position, said connecting means comprising biasing means biasingly maintaining a non-separated position between said mounting structure and said lock box structure, said biasing means permitting relative movement between said mounting structure and said lock box structure from said non-separated position to a separated position upon application of a separating force exceeding a predetermined biasing force to said biasing means, said releasable means being retained in said non-release position when said mounting structure and said lock box structure are in said non-separated position, said releasable means being moved to said released position when said mounting structure and said lock box structure are moved to said separated position, whereby said releasable means automatically unlocks said fitting to thereby unlock said seat belt after application of said separating force exceeding said predetermined biasing force.

5,181,739

SEAT BELT SYSTEM WITH COMFORT CONTROL

Barney Bauer, Clarkston; Brian K. Blackburn, Rochester, and Scott B. Gentry, Utica, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Nov. 27, 1990, Ser. No. 619,124
Int. Cl.[5] B60R *22/44*
U.S. Cl. 280—807 **4 Claims**



1. An apparatus comprising:

a rotatable spool with vehicle seat belt webbing wound around said spool, said spool being rotatable in a belt withdrawal direction and in a belt retraction direction;

a motor for rotating said spool in the belt withdrawal direction to pay out belt webbing from said spool;

a spring for rotating said spool in the belt retraction direction to wind belt webbing onto said spool;

means for selectively drivingly connecting said motor and said spool for, when drivingly connecting said motor and spool, preventing the biasing force of said spring from winding the belt webbing onto said spool, said means including (i) drive means for preventing the biasing force of said spring from winding the belt webbing onto said spool and (ii) an engageable clutch for, when engaged, drivingly connecting said spool and said drive means to prevent the biasing force of said spring from winding the belt webbing onto said spool; and

pressure sensing means for sensing the amount of tension in the belt webbing and providing a signal having a magnitude which continuously varies as the amount of tension in the belt webbing continuously varies;

said clutch being disengaged when the magnitude of said signal is below a first predetermined threshold value and being engaged when the magnitude of said signal is above said first predetermined threshold value;

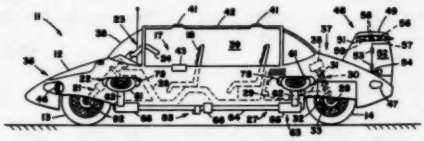
said motor being (a) actuated to rotate said spool in the belt withdrawal direction to pay out belt webbing from said spool when the magnitude of said signal is above a second predetermined threshold value which is greater than said first predetermined threshold value and (b) deactuated when the magnitude of said signal is below said second predetermined threshold value.

5,181,740

STABILIZED HIGH SPEED BI-WHEELED VEHICLE

Arthur Horn, 5001 Thorndale Dr., Oakland, Calif. 94611

Filed Mar. 1, 1991, Ser. No. 663,318
Int. Cl.[5] B60S *9/00*
U.S. Cl. 280—755 **3 Claims**



1. In a vehicle having a body defining an operator's compartment and having front and rear primary road wheels disposed in tandem relationship and situated substantially midway between opposite sides of the body and further having an engine for driving at least one of said road wheels and steering means for selectively angling said front road wheel relative to said rear road wheel, the combination comprising:

the lower regions of the opposite sides of said vehicle being convergent in the downward direction enabling sideward leaning of said vehicle during high speed turns, said vehicle having a configuration which enables sideward tilting of said vehicle into an orientation at which the vehicle has an inclination that is more horizontal than vertical,

at least one pair of pivot arms each having an inner end pivoted to said vehicle for vertical pivoting movement about pivot axes that extend longitudinally relative to said vehicle, said pivot arms being at opposite sides of said vehicle, each of said pivot arms having an outer end that extends sidewardly relative to said vehicle,

at least a pair of auxiliary road wheels each being carried by a separate one of said pivot arms at said outer end thereof, the axes of rotation of said auxiliary road wheels being substantially at right angles to said pivot axes of said pivot arms,

said auxiliary road wheels and pivot arms being vertically movable between a lowered position at which said auxiliary road wheels ride on the underlying roadway and a raised position at which said auxiliary road wheels extend laterally outward at opposite sides of said vehicle in position to ride on said roadway when said vehicle reaches a predetermined degree of sideward tilting at which the inclination of the vehicle is more horizontal than vertical,

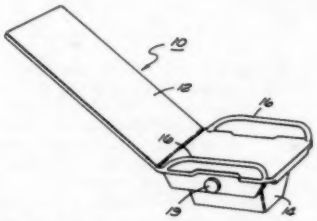
further including a pair of steering knuckles each coupling a separate one of said auxiliary road wheels to a separate one of said pivot arms and wherein said steering means angles said auxiliary road wheels in synchronism with said angling of said front primary road wheel, and wherein said steering means includes an inclined fork extending upward and backward from said front primary road wheel and means for enabling operator rotation of said fork to angle said front primary road wheel relative to said rear primary road wheel, a pair of steering knuckles each coupling a separate one of said pair of auxiliary road wheels to a separate one of said pair of pivot arms, a turnable member journalled to said vehicle for rotational motion about an axis that is situated midway between said

pivot axes of said pivot arms, a first pair of rods interconnecting said fork and said turnable member at opposite sides of the rotational axis of said fork and being coupled to said fork and said turnable member by pivoting joints, and a second pair of rods disposed at opposite sides of said vehicle and each of which interconnects said turnable member with the one of said steering knuckles that is at the same side of the vehicle, said second pair of rods being coupled to said turnable member and to said steering knuckles by pivoting joints, the couplings of said second pair of rods to said turnable member being at locations which lie on said pivot axes of said pivot arms when said front primary road wheel is unangled relative to said rear primary road wheel.

5,181,741
ICE BLOCK SLED

Lawrence S. Sheiman, and Jonathan C. Sheiman, both of 7310 Marina Pacifica Dr. S., Long Beach, Calif. 90803

Continuation of Ser. No. 294,169, Jan. 6, 1989, Pat. No. 5,039,130. This application Nov. 16, 1989, Ser. No. 437,731
Int. Cl.[5] B62B *9/04*
U.S. Cl. 280—845 **1 Claim**



1. A sled, comprising:

a support member having a seat member adapted to accommodate a rider, said support member having a top side and a bottom side and two lateral side edges;

an adjustable retention means for removably holding a block of ice on said support member, said retention means being connected to said bottom side of said support member, said adjustable retention means comprising:

first and second support blocks, each of said support blocks being fixed to said bottom side of said seat member adjacent to said first and second side edges thereof, respectively;

first and second springs, each of said springs having first and second ends, said first end of said first spring being coupled to said first support block and said first end of said second spring being coupled to said second support block such that said second ends of said first and second springs point inwardly toward a center line of said support member;

a first compression block coupled to said second end of said first spring and a second compression block coupled to said second end of said first spring such that said springs force said compression blocks inward to grip and hold said ice block.

5,181,742
COMBINATION NOTE AND ARTICLE SUPPORT DEVICE AND METHOD

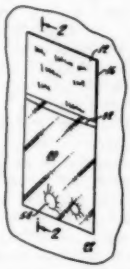
Mike Peng, 6200 Edinger - #409, Huntington Beach, Calif. 92647

Filed Feb. 3, 1992, Ser. No. 829,931
Int. Cl.[5] B42D *3/00*
U.S. Cl. 281—45 **13 Claims**

6. A combination note and article support system comprising:

a plurality of paper sheets each comprising low-tack adhesive means, on one side of each paper sheet, for adhesively securing each paper sheet to a surface, each paper sheet having a surface on an opposite side suitable for inscription by a marking device; and

a plurality of pouch means, one each attached to a paper

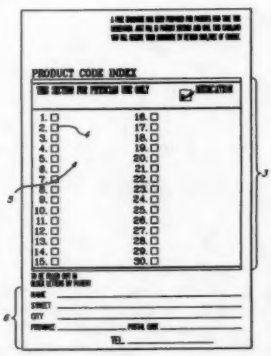


sheet, for removably holding an article, said pouch means being attached to the paper sheets at positions enabling a first paper sheet to be attached to a second paper sheet at a position sealing the pouch means attached to the second paper sheet.

5,181,743
DRUG INFORMATION REQUEST SYSTEM

Christopher Lloyd, 8533 Delmeade, Ville de Mount-Royal, Quebec, Canada H4T 1M1

Filed May 22, 1992, Ser. No. 886,848
Int. Cl.[5] G09B *19/22*
U.S. Cl. 283—48.1 **8 Claims**



1. A system for providing a consumer with means for requesting drug information, said system comprising

i) readable information retrieval means for presenting a plurality of index information groups, each index information group comprising a drug name and a unique identification symbol associated with said drug name, and

ii) at least one information request post card having a first information correlation component and a second postal destination component,

said first component comprising

a plurality of correlation groups,

each correlation group consisting of a said identification symbol and an associated check-off section for being marked so as to designate the said identification symbol, and

a consumer identification section for the insertion of postal information of a consumer,

said second component having a destination information

section comprising postal information of a distant site from which information about a drug associated with a designated identification symbol may be transmitted to a consumer using postal information present in said consumer identification section.

5,181,744

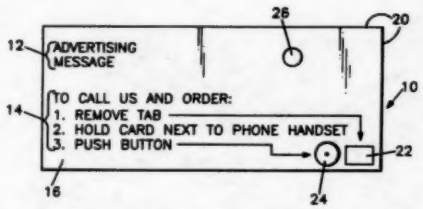
PROMOTIONAL AUTO DIALER CARD

Stephen M. Bethell, 11 Deer Trail, Clarksburg, N.J. 08510

Filed Mar. 15, 1991, Ser. No. 670,192

Int. Cl.[5] B42D *15/00*

U.S. Cl. 283—56 **17 Claims**



1. A promotional device for advertising and for causing a consumer to place a telephone call to an advertiser comprising:

(a) a card wherein said card is a planar member having a front surface, a back surface and a peripheral edge;

(b) a tone generator affixed to said card for generating tones for dialing

(c) a switch means for controlling said tone generator to selectively invoke tone generation; and

(d) a protective means for selectively protecting said switch means from inadvertent activation, said protective means being movable from a first position, wherein the activation of said switch means is prevented to a second position wherein the activation of said switching means is allowed.

5,181,745

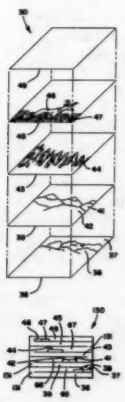
PRINTED IMAGE CREATING THE PERCEPTION OF DEPTH

Gary A. Jacobsen, 225 S. Cherry, Itasca, Ill. 60143, and Roger V. Jacobsen, 6049 N. Lawndale, Chicago, Ill. 60659

Filed Dec. 28, 1990, Ser. No. 635,362

Int. Cl.[5] B42D *15/00*

U.S. Cl. 283—94 **46 Claims**



1. A printed image, suitable for creating an illusion of depth in the perception of a viewer of the image, which comprises a multilayer transparent laminate structure having a back surface and a viewing front surface, wherein at least certain layers of said multi-layer structure each have a portion of the perceived image printed upon at least one surface of each certain layer, with that portion of the image perceived to be most distant from the viewer being located upon a printed layer which is furthest from the viewing front surface of the laminate structure, with that portion of the image perceived to be most proximate to the viewer being located upon a printed layer closest to said viewing front surface, and said layers are adhered together.

5,181,746

SEALING SLEEVE AND ITS USE

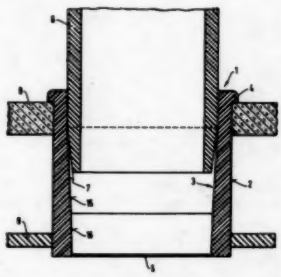
Joachim Hessel, Egelsbach; Rolf Koch, Eltville, and Wolfgang Sturm, Glashütten, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 16, 1991, Ser. No. 701,479

Claims priority, application Fed. Rep. of Germany, May 18, 1990, 4016062

Int. Cl.[5] F16L *35/00*

U.S. Cl. 285—3 **3 Claims**



1. A method for connecting a domestic drainage conduit to a collector sewer, wherein a drainage pipe to be connected is sloped on the outside at the end facing the collector sewer to form a cone, the drainage pipe is inserted in a sealing sleeve, which comprises a tubular, externally cylindrical body, the one side of which is closed by a thin elastic diaphragm, and on the other side of which, opposite the diaphragm, a radially outwardly projecting bead is mounted, and the inside wall forms essentially two stepped cones, the wall thickness continuously increasing throughout the extent of said cones toward and up to the diaphragm, the pipe with the sealing sleeve is pushed into the sewer through a bore hole in the wall of the collector sewer until the cone of the pipe has passed through the sleeve diaphragm and the ends of the pipe and the sleeve diaphragm protruding into the collector sewer are cut off at an adequate distance from the inside wall of the sewer.

5,181,747

METHOD FOR MANUFACTURING A JOINT AND A JOINT BETWEEN SECTIONS TO BE JOINED TO EACH OTHER AND SURROUNDED BY A JOINING COMPOUND

Olli Jovero, Porvoo, Finland, assignor to Neste Oy, Finland

Filed Nov. 2, 1990, Ser. No. 608,249

Claims priority, application Finland, Nov. 7, 1989, 895291

Int. Cl.[5] F16L *47/02*

U.S. Cl. 285—21 **2 Claims**

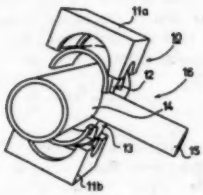
1. A method for manufacturing a T-joint between a first pipe member and a second pipe member, said method comprising the steps of:

bringing said first and second pipe members to be jointed into contact with each other;

covering an area between said first and second pipe members

to be jointed with an unheated flexible sheet material selected from the group consisting of sheet molding compounds and glass mat thermoplastics and thereafter;

pressing a mold against said sheet material covering said area to be jointed; and



heating said mold to harden and join said sheet material to said first and second pipe members; and

removing said mold out of contact with said joint area.

5,181,748

QUICK-ACTING COUPLING AND QUICK-ACTING COUPLING ASSEMBLY

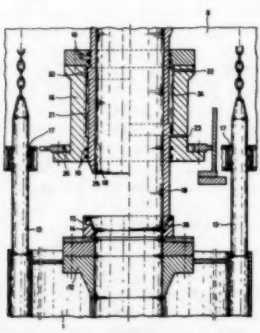
Leendert Poldervaart, La Turbie, and René Perratone, Menton, both of France, assignors to Single Buoy Moorings Inc., Marly, Switzerland

Filed Dec. 19, 1991, Ser. No. 810,160

Claims priority, application Netherlands, Dec. 19, 1990, 9002816

Int. Cl.[5] F16L *35/00*

U.S. Cl. 285—24 **8 Claims**



1. Quick-acting coupling for the fluid-tight connection of two parts, each provided with sealing elements with sealing faces, at least one sealing face comprising flexible sealing means, and coupling means being present for connecting said parts in such a way that they do not move relative to each other, wherein the sealing element of one part has a bevelled end and the sealing element of the other part has a correspondingly bevelled socket which receives said bevelled end and which have a substantial height of sealing contact with each other axially of the coupling, and wherein said flexible sealing means is free-standing and radially unconfined over the entire height of its sealing contact with the other said sealing face.

5,181,749

APPARATUS FOR SUPPORTING THE SIMULTANEOUS ESTABLISHMENT OF A PLURALITY OF PARALLEL, FLUID PLUG CONNECTIONS

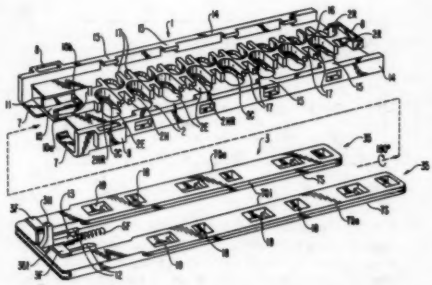
Dieter Feichtiger, Aidlingen, and Bernd Eichberger, Ottenbronn, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Apr. 25, 1991, Ser. No. 691,404

Claims priority, application Fed. Rep. of Germany, May 8, 1990, 4014666

Int. Cl.[5] F16L *35/00*

U.S. Cl. 285—26 **34 Claims**



1. An apparatus for supporting a simultaneous establishment of a plurality of parallel fluid plug connections, comprising a holding plate having apertures arranged in at least one straight row to receive axially inserted junction pieces of fluid lines which are provided with abutments, a securing slide, positive-fit guiding means for displaceably guiding said securing slide along the at least one straight row of apertures in the holding plate, said securing slide having at least one contour which, by displacing the securing slide can be brought into a position fastening the junction pieces in the apertures, wherein positive-fit axial fixing of the junction pieces are positive-fit axially fixed in the holding plate by an edge of the holding plate apertures of other than circular configuration, which edge extends at least over a limited perimeter section of each aperture and is configured to engage with the abutments of the junction pieces, each said edge being provided on one side and at the end of the greatest inside diameter of the apertures, and lateral fastening of the junction pieces transversely to their insertion direction within the apertures in the position in which their abutments are in engagement with the edge by the at least one contour of the securing slide, which contour is straight and extends in relation to the edge on the side of the junction pieces facing away from said edge.

5,181,750

GARDEN HOSE AND COUPLINGS

Donald J. Reum, Bonita Springs, Fla., assignor to Avon Plastics, Inc., Albany, Minn.

Filed Aug. 9, 1990, Ser. No. 564,876

Int. Cl.[5] F16L *35/00*

U.S. Cl. 285—38 **18 Claims**

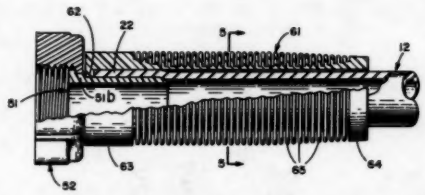
1. An improved hose coupling for the end of a hose having an internal bore of predetermined size, comprising:

a coupling member comprising an internal projecting portion and an external coupling portion, the projecting portion being of predetermined axial length and diametrically sized for insertion into the bore of the hose end, the external coupling portion projecting externally of the hose end and including coupling means for joinder to a mateable coupling;

means for securing the coupling member to the hose; and

a strain relief handle of generally tubular configuration sized to fit over the external surface of the hose and extending

a predetermined distance along said hose from a point adjacent the external coupling portion of the coupling member, the strain relief handle member being constructed to permit limited bending of that portion of the hose over which it fits;

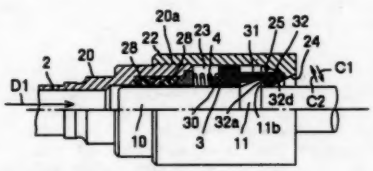


said strain relief handle member comprising a tubular body member and a plurality of spaced disk members extending radially outward from the body member, said body and disk members being formed from resilient, flexible material, with each of said disk members being relatively thin to permit individual resilient flexibility thereof.

5,181,751
QUICK CONNECTOR

Hirokazu Kitamura, Kasugai, Japan, assignor to Tokai Rubber Industries, Ltd., Komaki, Japan

Filed Nov. 27, 1990, Ser. No. 618,412
Claims priority, application Japan, May 31, 1990, 2-144186
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—39 **13 Claims**



13. A quick connector comprising:

a tubular-shaped first member including a first tube having a predetermined outer diameter and a ring-shaped projection disposed on an outer peripheral surface of said first tube;

a tubular-shaped second member including a socket at an end thereof and a second tube having a cylindrical shape, said socket including a cylinder-shaped receiver hole having an opening for passage of a first end of said first tube of said first member therein, and a first regulatory inner peripheral surface having an inner diameter decreasing in size toward said opening, said second tube including a second regulatory inner peripheral surface having substantially the same inner diameter as the outer diameter of an end of said first tube of said first member for engaging said end of said first tube disposed through said opening;

an engager claw member disposed in said cylinder-shaped receiver hole, and having a length shorter than a length of said cylinder-shaped receiver hole in a direction parallel to a central axis of said socket, said engager claw member interposed between an inner peripheral surface of said socket and an outer peripheral surface of said first tube and movable in a direction parallel to said central axis of said socket, said engager claw member including a ring-shaped base, a plurality of arms extending from said ring-shaped base to said opening in a direction parallel to said central axis of said socket, said arms being deformable in a radial direction, and a claw extending from an end of each of said arms and engaging with said ring-shaped projection of said first member when said first member is moved into said socket thereby expanding said arms so that said ring shaped projection will move past each said claw;

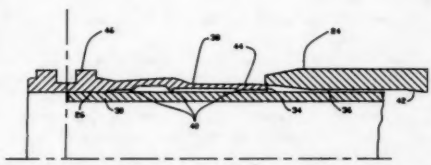
an urging member disposed in said cylinder-shaped receiver hole, urging said engager claw member to said opening of said socket in a direction parallel to said central axis of said socket to push said claw of said engaging claw member between said first regulatory inner peripheral surface of said socket and said outer peripheral surface of said first tube of said first member for urging each said claw radially inwardly thereby enhancing the engagement between said socket and said first tube; and

a disengaging member including a tube having a through hole inserted around said first member and a tapered surface formed at a forward end thereof, said tapered surface pressing said claws of said engaging claw member outwardly in a radial direction.

5,181,752
PIPE FITTING WITH SWAGE RING LOCKING MECHANISM

Robert W. Benson, San Carlos; Mark J. Beiley, Daly City; Sohel A. Sareshwala, San Leandro; Steven T. Croft, Atherton, and Jack M. Vaughn, Sunnyvale, all of Calif., assignors to Lokring Corporation, Foster City, Calif.

Filed Jun. 26, 1990, Ser. No. 544,179
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—81 **28 Claims**



1. A pipe fitting adapted to be joined to a pipe comprising:

a coupling body with a body inner surface adapted for receiving a pipe and a body outer surface;

a swage ring which defines a ring inner surface, which ring inner surface is urgeable over the body outer surface in order to cause a tooth defined by the body inner surface to engage and be secured to the pipe to create a seal with the pipe positioned in the coupling body; and

a locking means formed in said body outer surface and the ring inner surface for lockingly engaging the swage ring to the coupling body, in order to prevent relative motion between said coupling body and said swage ring, with the swage ring urged over said coupling body in order to create said seal between the coupling body and the pipe; and

wherein said locking means includes:

a body roughened area defined on a portion of said body outer surface;

a ring roughened area defined on a portion of said ring inner surface; and

said body roughened area located on said body outer surface in a portion such that with said swage ring urged over said coupling body in order to create said seal with the pipe, said body roughened area lockingly engages said ring roughened area in order to prevent relative motion between said coupling body and said swage ring;

wherein the portion of the body outer surface on which the body roughened area is defined has a substantially uniform outer diameter along the length of the coupling body; and

wherein both the body roughened area and the ring roughened area have an arithmetical average roughness dimension which is substantially smaller than the tooth of the

body inner surface which engages and is secured to the pipe to create a seal.

5,181,753

DEVICE FOR WITHDRAWING LIQUID FROM A RESERVOIR BY MEANS OF A WATER JET DEVICE

Jan C. van Hattem, Amerongen, and Jan A. E. Sperna Weiland, Deventer, both of Netherlands, assignors to Sara Lee/DE N.V., Utrecht, Netherlands

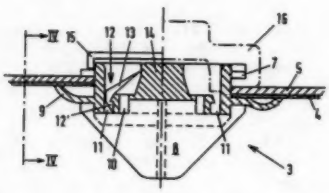
Filed Apr. 13, 1990, Ser. No. 508,577

Claims priority, application Netherlands, Apr. 14, 1989, 8900942

The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.

Int. Cl.[5] F16L *41/06*

U.S. Cl. 285—205 **7 Claims**



1. An apparatus for withdrawing liquid from a reservoir, comprising:

a reservoir box having a bottom wall provided with an opening;

a flexible bag for containing a supply of liquid to be withdrawn from said flexible bag through said opening, said flexible bag being supported in said reservoir box;

a connector extending as an outlet opening means from within said flexible bag near said bottom wall, down and out of said flexible bag through said opening;

said connector being fitted with a valve mechanism including a normally closed lip seal which, while externally subjected to lowered pressure flexes to an open condition which permits liquid contained in the bag to flow out through the connector; and

a water jet assembly comprising:

a water jet device arranged to be connected at an inlet end thereof to a supply of pressurized water and to be connected at an outlet end therefor to a drain for water mixed with liquid withdrawn from said flexible bag by operation of said water jet device, said water jet device including a socket through which water is jetted, in use, for creating a lowered pressure on said lip seal, said lip seal arranged to be communicated by said socket, in use, to water jetted through said socket; and a clamping device at least partially housing said water jet assembly, characterized in that the clamping device is arranged to be fixed and put into sealing abutment with said connector in one movement.

5,181,754

VEHICULAR DOOR LOCK DEVICE

Thoru Shibata, Utsunomiya, Japan, assignor to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1991, Ser. No. 732,528

Claims priority, application Japan, Jul. 20, 1990, 2-192291; Dec. 12, 1990, 2-410277

Int. Cl.[5] E05C *3/26*

U.S. Cl. 292—216 **5 Claims**

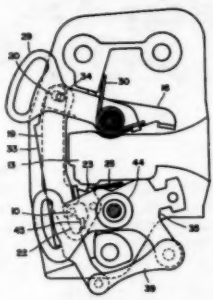
1. A vehicular door lock device comprising:

a lock body provided at its front side with a guide groove into which a striker fixed to the vehicular body enters and at its rear side with a raised portion for defining said guide groove;

a latch journalled rotatably with the lock body and engaged with the striker;

a ratchet for holding an engagement of said latch with said striker;

an opening lever rotatably journalled with the rear side of the lock body at a position above the raised portion and connected to an outer handle of the door;



locking lever means rotatably journalled to the rear side of the lock body at a position below the raised portion for locking and unlocking the door with a key;

operative link means placed between said locking lever means and said opening lever for unlocking the door when it engages said ratchet and being disengaged from said ratchet when said locking lever means is rotated to lock the door; and

wherein said operative link means and said locking lever means are connected by an intermediate link, and said operative link means is placed so as to not overlap with the raised portion.

5,181,755

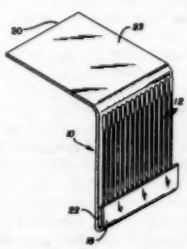
SMALL OBJECT HANDLING DEVICE, ASSEMBLY AND METHOD OF MANUFACTURE

Lawrence J. Stanwich, Wellesley; Kenneth J. Berk, Newton; Fredrick M. Berk, Brookline, and Donald A. Berk, Newton, all of Mass., assignors to Pulpdent Corporation, Watertown, Mass.

Filed Feb. 7, 1991, Ser. No. 651,997

Int. Cl.[5] B66C *1/00*

U.S. Cl. 294—1.1 **1 Claim**



1. Assembly of small object handling devices, comprising: a support rack; a multiplicity of elongated rods, with each rod having a round cross-section and having one end thereof connected to said support rack, such that each rod may be readily broken off for independent use, and an opposite unconnected end; and a coating of a pressure sensitive adhesive composition surrounding the unconnected end thereof, and uniformly extending over the sides adjacent said unconnected end, with said pressure sensitive adhesive composition consisting essen-

tially of wax and a tackifier, with the tackifier selected from the group consisting of wood rosins, rosin acids, rosin esters, polyterpenes, terpene-phenolics, phenol-formaldehyde resins, alpha-methylstyrene polymers, vinyl toluene polymers, coumarone-indene resins, amorphous polypropylene, hydrocarbon resins having between C_5 and C_9 carbon atoms, natural or butyl or styrene copolymer rubber, silicone gum, and ethylenevinyl acetate copolymers; further comprising a flexible strip having one end connected to said rack, and an opposite free end for folding over and protecting said rods, and to provide a matchbook-like appearance.

5,181,756

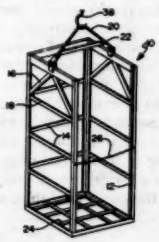
HOISTING CAGE WITH INTERIOR TRUSS DESIGN

Michael R. Yurick, 995 Ladd Rd., Walled Lake, Mich. 48088

Filed Jun. 3, 1991, Ser. No. 709,111

Int. Cl.[5] B62D *6/34*

U.S. Cl. 294—68.1 **5 Claims**



1. A hoisting cage for hoisting concrete forms and building materials, comprising:

(a) a cage in the general shape of a polygonal box, with a top and a bottom, said cage being capable of holding concrete forms and building materials, said cage having a frame with vertical bars at the edges of said cage and a plurality of horizontal bars attached to said vertical bars;

(b) at least two inverted V-shaped trusses, each truss having two ends and an apex in the middle of the truss, said trusses being positioned such that the apexes of said inverted V-shaped trusses are attached to first and second horizontal bars at a point which is below the top of the cage, the first end of each of said inverted V-shaped trusses being attached to a vertical bar of said cage and the second end of each of said inverted V-shaped trusses being attached to another vertical bar of said cage; and

(c) a catch for receiving the grasp of a lifting apparatus, said catch having two ends, the first end being rotatably attached to the first horizontal bar near the point where the apex of the first inverted V-shaped truss is attached to the first horizontal bar, the second end being rotatably attached to the second horizontal bar near the point where the apex of the second inverted V-shaped truss is attached to the second horizontal bar, such that the catch is capable of folding down to reduce the overall height of the hoisting cage in order to facilitate its transportation,

whereby said hoisting cage is capable of being hoisted by a lifting apparatus secured to the catch and the mechanical stresses due to lifting the weight of the hoisting cage and its contents are transmitted through the hoisting bar to said inverted V-shaped trusses and then distributed substantially to the vertical bars of the hoisting cage.

5,181,757

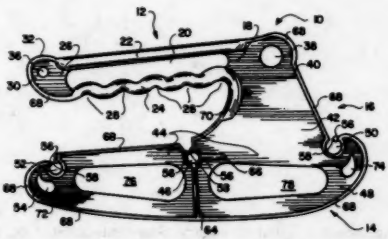
PLASTIC BAG CARRIER

Arturo T. Montoya, 7985 SW. 86th St., Apt. 410, Miami, Fla. 33413

Continuation-in-part of Ser. No. 683,031, Apr. 11, 1991, Pat. No. Des. 325,169, which is a continuation-in-part of Ser. No. 592,903, Oct. 4, 1990, abandoned. This application Nov. 25, 1991, Ser. No. 796,657

Int. Cl.[5] B65D *33/06*

U.S. Cl. 294—159 **1 Claim**



1. A shopping bag carrier for suspending a plurality of shopping bags, each shopping bag having a bag handle or handles, said bag carrier comprising:

an upper, graspable, generally horizontal handle member including a plurality of finger receiving indentations therealong which are more than four in number whereby, in use, the hand of a user may be adjusted along said handle member to balance a bag load suspended from said carrier, said handle member further comprises means defining an elongated opening in and through said handle member, thus to define upper and lower handle member portions, said finger receiving indentations being formed on a lower surface of said lower handle member portion, said lower handle member portion being made of slightly resilient material whereby it may bend slightly for user hand comfort when said carrier is in use, suspending a plurality of bags;

a lower, extended length bag support member means for suspending a plurality of shopping bags or the like therefrom;

a transverse web interconnecting said handle member and said bag support member means; and

said bag support member means further comprising a first, generally centrally located captive opening means within which a handle or handles of a shopping bag may be placed, and a second captive opening means displaced horizontally apart from said first captive opening means, within which a handle or handles of an additional shopping bag may be placed, said bag support member means further comprises a third captive opening means for supporting yet an additional shopping bag by its handle or handles, and being horizontally spaced apart from said first captive opening means and oppositely from said second captive opening means, said second and third opening means being disposed substantially equidistantly from, and to either side of, said first captive opening means.

5,181,758

VEHICLE SEAT ARRANGEMENT

Lars V. Sandvik, Vargarda, Sweden, assignor to General Engineering (Netherlands) B.V., Utrecht, Netherlands

Filed Aug. 16, 1991, Ser. No. 746,660

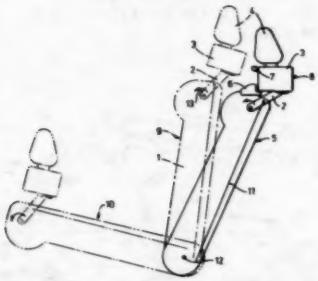
Claims priority, application United Kingdom, Aug. 17, 1990, 9018119

Int. Cl.[5] B60N *2/20, 2/48*

U.S. Cl. 296—68.1 **13 Claims**

1. A locking mechanism for the back of a vehicle seat, the back of the seat being adapted to be moved from a substantially

upright operative position to a forwardly tilted inoperative position, the locking mechanism being adapted to lock the back of the seat in the operative position, the locking mechanism comprising a locking element extending substantially across the whole width of a vehicle in which the seat is fitted, and being mounted on the back of the seat, the locking element



having means adapted to engage abutments located on each side of the motor vehicle, the locking element being pivotably movable relative to the back of the seat between a locking position and a release position, the locking element, when in the locking position, engaging the abutments provided on each side of the vehicle, and further including a retractor mechanism mounted on the locking element to move therewith.

5,181,759

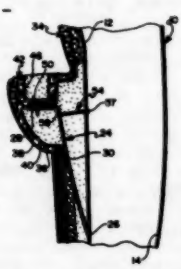
COLLAPSIBLE ARM REST

Edson P. Doolittle, Rochester Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 21, 1992, Ser. No. 838,994

Int. Cl.[5] B60J 9/00

U.S. Cl. 296—153 **3 Claims**



1. An arm rest construction for a vehicle door comprising:

a door inner panel mounted on the vehicle door;

a door trim panel attached to the door inner panel and having an arm rest carried thereon;

an arm rest support member having a lower end mounted on the door inner panel and an upper end spaced laterally inboard from the door inner panel and underlying the arm rest to support the arm rest;

and collapsible tether means acting between the upper end of the arm rest support member and the door inner panel whereby the tether means effectively connects the arm rest to the door so that pulling on the arm rest closes the door and said tether means collapsing to permit lateral movement of the arm rest toward the door inner panel under imposition of force against the arm rest in the outboard direction.

5,181,760

MOTOR VEHICLE TRAILER WITH COUNTERBALANCING WEIGHTS

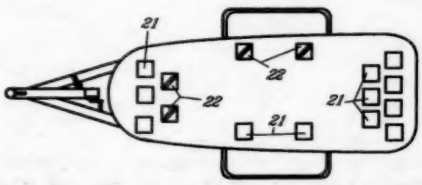
Paul Muno, Am Kalvarienberg 2, D-8961 Untrasried-Hopferbach, Fed. Rep. of Germany

Continuation of Ser. No. 680,902, Apr. 5, 1991, abandoned. This application Mar. 6, 1992, Ser. No. 845,832

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1990, 9003948[U]

Int. Cl.[5] B60P 3/07, 3/10

U.S. Cl. 296—181 **5 Claims**



1. A trailer with front and rear ends and lateral sides comprising at least two vertical walls, a floor and a top thereof which together define an interior space, wherein said floor of said trailer is provided with a plurality of recesses sunken below a level of the floor, said recesses each having a horizontal perimeter, said perimeter closely engaging an exterior surface of a horizontal cross-section of one of a plurality of rigid counterbalancing weight means for counterbalancing the contents of said interior space of said trailer so as to provide stability in use wherein said plurality of recesses are disposed adjacent said front and rear ends, and adjacent lateral portions of said floor of said trailer, and wherein said counterbalancing weight means are shaped so as to be interchangeable between said recesses so as to provide proper weight balance for said trailer depending on the position of the contents of the trailer.

5,181,761

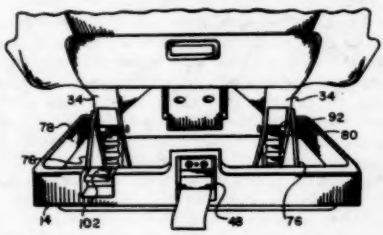
CHILD RESTRAINT SYSTEM

Paul K. Meeker, Aurora, Ohio, assignor to Lisco, Inc., Tampa, Fla.

Filed Sep. 12, 1991, Ser. No. 762,532

Int. Cl.[5] B60N 2/28

U.S. Cl. 297—250 **6 Claims**



1. A restraining system for a child comprising in combination:

a child seat having a foot end and a head end and side edges therebetween, the seat having downwardly extending projections with aligned apertures;

a base having a front end and a back end and side edges therebetween, the base having upwardly extending projections with aligned apertures;

a cylindrical pivot shaft located within the apertures of the beat and base to allow the pivoting of the seat with respect to the base;

a pin located at each edge of the seat adjacent to the front thereof;

a latch rod pivotally secured across the front of the base with a latch mounted adjacent to each end thereof, each latch having a plurality of forwardly facing recesses located on above the other in a convex curved orientation and adapted to receive a pin of the seat to thereby secure the seat in any one of a plurality of angular positions; and

spring means coupled between the base and one of the latches to hold the recesses in contact with the pins.

5,181,762

BIOMECHANICAL BODY SUPPORT WITH TILTING LEG REST TILTING SEAT AND TILTING AND LOWERING BACKREST

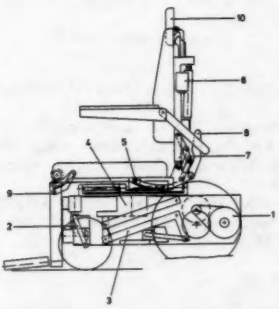
Anton H. Beumer, Silvolde, Netherlands, assignor to Revab B.V., Silvolde, Netherlands

Filed Apr. 30, 1991, Ser. No. 693,360

Claims priority, application Netherlands, May 2, 1990, 9001053

Int. Cl.[5] A47C *1/02, 1/06, 1/12*

U.S. Cl. 297—358 **16 Claims**



1. A biomechanical body support comprising a substructure, a seat which is supported by said substructure and is tiltable relative to said substructure by a first tilt means, a backrest which is coupled to said seat and is tiltable relative to said seat by a second tilt means, a tilting axis of the second tilt means approximately coinciding with the pivotal point of the hip joint of a person resting on said seat, a leg support also tiltably connected to said seat by a third tilt means, characterized in that the backrest **(14)** is slideably mounted on a reverse U-shaped tilting frame **(6)** arranged behind the backrest by a slide means, a fixed leg of said frame, which is directed towards the backrest, being hingedly connected to a first pivot (A) of the seat by a hinge means **(15)** while a second leg of said frame **(12)** having length-adjustable means connected to a second pivot (B) of the seat, the backrest **(14)** being connected to the seat **(15)** by adjusting mechanism means for sliding the backrest **(14)** relative to the tilting frame **(6)** in the direction of the seat **(15)** upon downward pivoting movement of the tilting frame **(6)**.

5,181,763

APPARATUS FOR PREVENTING WHIPLASH

Ronald P. Dellanno, 532 Broad St., Bloomfield, N.J. 07003, and Quentin E. Gualtier, North Caldwell, N.J., assignors to Ronald P. Dellanno, Bloomfield, N.J.

Continuation of Ser. No. 585,392, Sep. 20, 1990, abandoned. This application Oct. 7, 1991, Ser. No. 771,827

Int. Cl.[5] A47C *7/36*

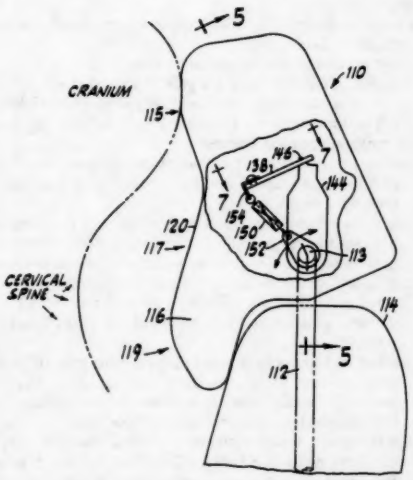
U.S. Cl. 297—391 **8 Claims**

1. An apparatus for preventing whiplash related injuries to a passenger in a vehicle, comprising:

a frame supported on a seat of the vehicle and located behind the cranium and cervical spine of a passenger on the seat;

a layer of resilient material supported on the frame, the layer of resilient material defining a supporting surface located behind the cranium and cervical spine of the passenger and defining a contour that corresponds to the posterior contour of the passenger's cranium and cervical spine, wherein the supporting surface defines a first area located to contact and support the approximate central posterior area of the passenger's cranium, a second area located below the first area to contact and support the posterior area approximately where the passenger's cranium meets the cervical spine, and a third area located below the second area to contact and support the posterior area of the passenger's cervical spine, the first, second and third areas each contacting the respective areas of the passenger's cranium and cervical spine to substantially simultaneously decelerate those areas during a vehicle collision and prevent whiplash related injuries;

a support member coupled to the frame and supported on the seat, the support member being vertically moveable relative to the seat to adjust the position of the apparatus relative to the passenger and align the position of the supporting surface with the posterior contour of the passenger's cranium and cervical spine, the frame being journaled to the support member and normally biased toward



the front of the seat, whereupon during a vehicle collision, when the passenger's head is forced toward the supporting surface, the posterior portion of the passenger's cranium initially contacts the first area of the supporting surface and rotates the frame relative to the support member toward the back of the seat and, in turn, rotates the second and third areas of the supporting surface into contact with the posterior portion of the passenger's lower cranium and cervical spine; and wherein

the support member includes two support legs and a bar extending therebetween, the two support legs being oriented substantially parallel relative to each other and supported on the seat, and the frame is journaled to the bar;

a stop member coupled to the bar and projecting upwardly therefrom;

a stop plate coupled to the frame and moveable relative to the stop member; and

a spring coupled between the stop plate and the bar, wherein the spring biases the stop plate to slide relative to the stop member toward the front of the seat and, thus, biases the stop plate and frame toward the passenger's head.

5,181,764

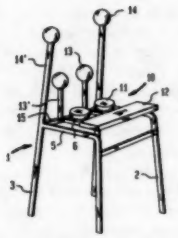
CHAIR AND SEAT APPARATUS, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Hattie Wiener, 322 W. 57th St., New York, N.Y. 10019

Continuation-in-part of Ser. No. 558,159, Jul. 25, 1990, Pat. No. 5,052,755. This application Oct. 1, 1991, Ser. No. 769,364

Int. Cl.[5] A47C *7/02*

U.S. Cl. 297—452 **20 Claims**



1. A chair adapted to support a user's body so as to eliminate undesirable pressure to parts of the user's body including the spine, comprising:

a frame including means for supporting the chair on a horizontal surface;

a seat portion supported on said frame;

said seat portion including a pair of spaced-apart buttocks support members for independently supporting right and left buttock portions of the user's body, without any body-contacting portion therebetween;

said seat portion further including an elongated thigh support member adapted to support back portions of each of the user's thighs;

said elongated thigh support member having the longitudinal axis thereof extending across the width of said seat portion so as to define a front part of said seat portion;

said spaced-apart buttocks support members being rearwardly spaced from said thigh support member so as to define a separate and independent back part of said seat portion;

each of said buttocks support members and said thigh support member being separately and independently supported on separate portions of said frame, without any body-contacting portions therebetween; and

the combined width dimensions of said buttocks support members being substantially less than the width of said front part of said seat portion defined by said thigh support member.

5,181,765

HEAT TREATED LATCH PLATE

Richard W. Glover, Troy, Ohio, assignor to Lisco, Inc., Tampa, Fla.

Filed Mar. 1, 1991, Ser. No. 663,503

Int. Cl.[5] A44B *11/25*; B60R *21/00*

U.S. Cl. 297—467 **5 Claims**

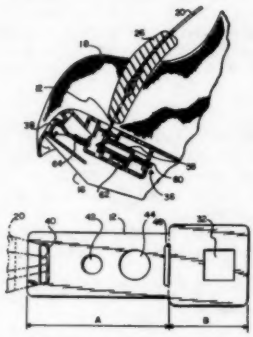
1. A child's car seat comprising

a rigid frame having back, bottom, and said portions and a buckle located therein;

strap means extending from the back over the shoulders of a child occupant of the seat, the strap having lower ends;

a T-shield secured to the lower ends of the straps; and

a unitary metallic latch plate, the latch plate having a longitudinal axis along its length with an upper portion constituting the majority of the length and with an opening transverse to the longitudinal axis receiving the straps, the latch plate also having a lower portion constituting the minor portion of the length with a locking aperture to be releasably secured in the buckle, the upper portion of the latch plate being of a first rigidity and being en compassed and secured within the T-shield and the lower portion of



the latch plate being heat treated to render it more rigid than the upper portion.

5,181,766

SYSTEM FOR CUTTING AND CONVEYING COAL AND THE LIKE

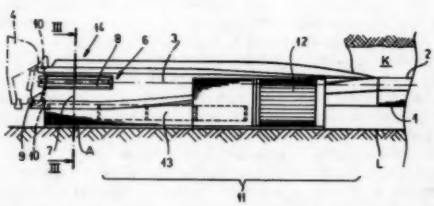
Peter Heintzmannn, Bochum, and Kuno Guse, Witten-Bommern, both of Fed. Rep. of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Mar. 19, 1992, Ser. No. 854,825

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1991, 4109290

Int. Cl.[5] E21B *25/56*

U.S. Cl. 299—34 **6 Claims**



1. A long-wall mining apparatus comprising:

a conveyor trough extending longitudinally from a turnaround adjacent a longitudinal face from which material is to be cut;

a pair of longitudinally extending and generally parallel rear guide rails extending along and flanking the conveyor;

a pair of longitudinally extending and generally parallel front guide rails extending along the face between the conveyor trough and the face;

a longitudinally fixed anchor bollard in the turnaround provided with upper and lower guide rails each connecting a respective one of the front guide rails to a respective one of the rear guide rails;

a drive wheel in the bollard rotatable about an upright axis and having an outer periphery exposed between the bollard guide rails;

a chain having front and rear stretches respectively running along the guide rails and engaged in the turnaround with the periphery of the drive wheel;

conveyor/cutting elements on the chain riding on the rails and displaceable in the front stretch along the face and in the rear stretch along the trough; and

a drive motor at the turnaround connected to the drive

wheel for advancing the chain in the front stretch to scrape material from the face and deposit it in the conveyor trough and for displacing the chain toward the turnaround in the rear stretch to move the scraped-off material along the trough.

5,181,767

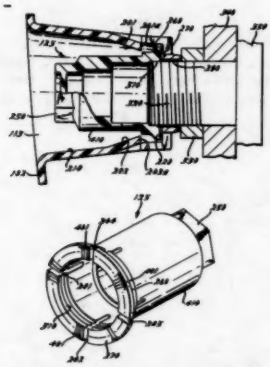
LUG NUT RETENTION FOR WHEEL COVER

Richard D. Hudgins, Fallbrook, Calif.; Lawrence R. Sounart, Sterling Heights, and Alan G. Storck, Union Lake, both of Mich., assignors to Thompson International, Inc., Troy, Mich.

Continuation of Ser. No. 559,274, Jul. 30, 1990, abandoned. This application Nov. 1, 1991, Ser. No. 785,868

Int. Cl.[5] B60B *7/12*

U.S. Cl. 301—37.37 **10 Claims**



1. A wheel cover assembly for covering the rim portion of a vehicular wheel, said assembly comprising: a wheel cover; a lug stud opening disposed through said wheel cover for receiving a projecting threaded lug stud from a vehicular wheel; a retainer nut having a generally tubular body centered over said lug stud opening with a lower body portion engaging said wheel cover, an upper body portion, and a flange disposed about said lower body portion; an internal thread pattern disposed within said lower body portion for threadably engaging the lug stud to retain said wheel cover over the vehicular wheel; and characterized by a segmented slot intersecting said internal thread pattern and extending completely through said lower body portion and said flange with said upper body portion uninterrupted by said slot for permitting circumferential flexibility of said retainer nut in the area of said internal thread pattern and said flange.

5,181,768

PRESSURE SWITCH VALVE, FOR HYDRAULIC VEHICLE BRAKE SYSTEMS WITH TRACTION CONTROL (ASR)

Guenter Wolff, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

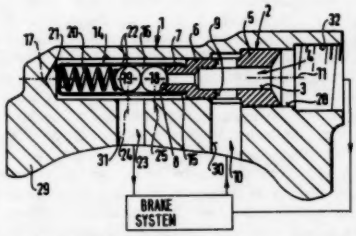
Filed May 13, 1991, Ser. No. 699,030

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1990, 4019068

Int. Cl.[5] A60T *8/32;* **B60K** *28/16*

U.S. Cl. 303—84.2 **7 Claims**

1. A pressure switch valve, for hydraulic vehicle brake systems with traction control (ASR), comprising a cylindrical chamber (16), having an inflow conduit and an outflow conduit for pressure fluid, a longitudinally movable valve closing first ball (18) and a second ball (19) in axial alignment in said cylindrical chamber, a compression spring (20) in contact with said second ball (19) that applies an axial force directly on said second ball and indirectly on said closing first ball in which said closing first ball cooperates with a valve seat (8), said closing first ball (18), said second ball (19) and said compression spring are received in said cylindrical chamber (16) with slight radial play and disposed along a longitudinal axis of said cylindrical cylinder, and said closing first ball (18) engages the valve seat (8), said second ball (19) is supported on the first ball (18), under the influence of the compression spring (20) specifically on a side remote from the valve seat (8), an outflow



conduit (23) which branches off from the cylindrical chamber (16) at a point such that upon switching of the pressure switch valve (1) and movement of the first ball such that a plane (25) normal to a longitudinal axis (17) of said cylindrical chamber (16) and through a spherical center of the closing first ball (18), does not reach a mouth cross section of the outflow conduit (23) until after a corresponding plane (24) relative to said second ball (19) has already passed beyond the mouth cross section of said outflow conduit (23).

5,181,769

AUTOMOTIVE VEHICLE BRAKE UNIT WITH ANTI-LOCKING DEVICE

Lothar Schiel, Hofheim, Fed. Rep. of Germany; Hubertus von Gruenberg, Rochester, Mich.; Wilfried Wagner, Huettenberg-Weidenhausen, Fed. Rep. of Germany; Manfred Rueffer, Sulzbach, Fed. Rep. of Germany, and Christoph Jung, Eppstein/Ts., Fed. Rep. of Germany, assignors to ITT Corporation, New York, N.Y.

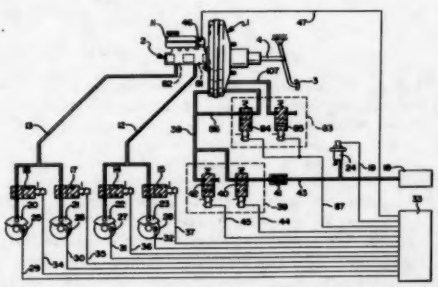
PCT No. PCT/EP89/00720, § 371 Date Feb. 22, 1990, § 102(e) Date Feb. 22, 1990, PCT Pub. No. WO90/00126, PCT Pub. Date Jan. 11, 1990

PCT Filed Jun. 27, 1989, Ser. No. 460,939

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1988, 3822260; Mar. 13, 1989, 3908062; Mar. 25, 1989, 3909924; May 22, 1989, 3916640; Jun. 13, 1989, 3919216

Int. Cl.[5] B60T *8/40*

U.S. Cl. 303—114.3 **9 Claims**



1. An automotive vehicle brake unit with an anti-locking device comprising: a vacuum brake power booster functionally disposed intermediate a brake pedal and a master brake cylinder and including at least two power chambers divided from each other by a movable wall, the first of said chambers con-

nectible to a vacuum source and the second of said chambers aeratable through a control valve actuatable by an input member coupled to the brake pedal to effect generation of boosting power being proportional to the power applied to the brake pedal, said first power chamber aeratable by a first valve arrangement; wheel cylinders connected to primary and secondary pressure chambers of the master brake cylinder through brake lines; sensors associated with wheels to be braked operative to monitor the rotating behavior of the wheels and to generate output signals in response thereto; a central electronic control unit operative to receive said output signals and to generate control signals as a function thereof; electromagnetically actuatable hydraulic fluid inlet and outlet valves inserted in the brake lines response to said output signals for effecting slip control, wherein said wall of said vacuum brake power booster is movable independently of said input member and is in power-transmitting connection with a portion of a primary piston partially defining said pressure chamber; and a further hydraulic chamber defined by and reacting between piston means carried for displacement with said input member and a fixed portion of said unit and selectively communicating through a link with a pressureless hydraulic fluid reservoir including direct acting valve means, said link operable to interrupt said communication between said further chamber and reservoir in response to said control signals, wherein the further hydraulic chamber is configurated in a cylindrical section closing an axial extension of said master brake cylinder projecting into said first power chamber of said vacuum brake power booster.

5,181,770

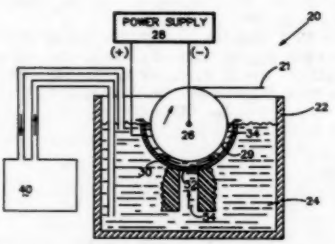
SURFACE TOPOGRAPHY OPTIMIZATION THROUGH CONTROL OF CHLORIDE CONCENTRATION IN ELECTROFORMED COPPER FOIL

Andrew J. Brock, Cheshire; Lifun Lin, Hamden; Paul Menkin, Branford, and Ned W. Polan, Madison, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 340,317, Apr. 19, 1989, abandoned. This application Jun. 11, 1990, Ser. No. 537,215

Int. Cl.[5] C25D *1/04*

U.S. Cl. 205—77 **9 Claims**



1. A process for forming an electroformed metal foil having a uniform matte surface texture, comprising the steps of:

providing an electrodeposition system containing:

(a) a tank containing an electrolyte solution;

(b) providing an essentially contamination-free acidic electrolyte in which impurities such as organics and sulfides are less than about 5 parts per million and containing ions of copper and an effective concentration of chloride ions to produce said uniform matte surface texture, said electrolyte comprising from about 50 grams per liter to about 150 grams per liter copper, from about 10 grams per liter to about 100 grams per liter sulfuric acid and from about 0.5 ppm to about 2.5 ppm chloride;

(c) a cathode having a continuous plating surface at least partially immersed in said electrolyte solution, said immersed plating surface defining the extent of the plating zone; and

(d) an anode;

applying a desired current density to said cathode and said anode for plating metal values from said electrolyte solution onto said plating surface to generate a substantially uniform current distribution throughout said plating zone for promoting formation of said substantially uniform metal foil thereby electrolytically generating said foil of copper from said electrolyte;

filtering said electrolyte so that it is essentially free of sulfides, organic materials and other contaminants and particulates; and

providing a flow rate of said electrolyte past said cathode sufficient to prevent oxygen accumulation along said cathode.

5,181,771

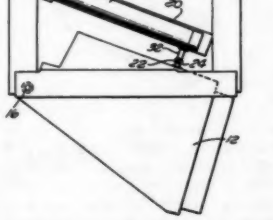
TRIPLE SPRING TORQUE MOTOR

Edward Robak, Orange, and Carter K. Reh, Santa Ana, both of Calif., assignors to Sony Trans Com Inc., Irvine, Calif.

Filed Mar. 1, 1991, Ser. No. 662,738

Int. Cl.[5] A47B *81/06*

U.S. Cl. 312—7.2 **25 Claims**



1. A display unit for being attached to a structure, said display unit being constructed to stow and expose a video display device to a viewer, said display unit comprising:

a frame;

a monitor operatively connected to said frame such that said monitor can move from a first position to a second position relative to said frame, wherein said monitor is stowed within said frame in said first position and said monitor is exposed to a viewer in said second position such that the viewer can view said monitor;

actuation means operatively connected to said frame and said monitor for moving said monitor from said first position to said second position;

drive means operatively connected to said actuation means; and,

a spring motor having at least two parallel torsional springs operatively connected to said actuation means to move said monitor from said second position to said first position.

5,181,772

FURNITURE ELEMENT

Alfred Albiez, Langen, Austria, assignor to Alfit Aktiengesellschaft, Gotzis, Austria

Filed Jul. 11, 1991, Ser. No. 728,257

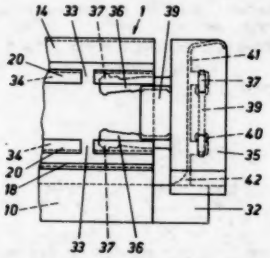
Int. Cl.[5] A47B *47/00*

U.S. Cl. 312—348.4 **15 Claims**

1. A furniture element for forming a corner of a drawer comprising:

at least two long, flat structural elements having sides and ends which join to form a corner, and

connector means having a supporting element for providing a connection with at least one of said structural elements, said structural elements including a profile element with an insertion guide for receiving said supporting element, said profile element including profile projections which protrude from one side of said structural elements and extend the length of said structural elements, said profile



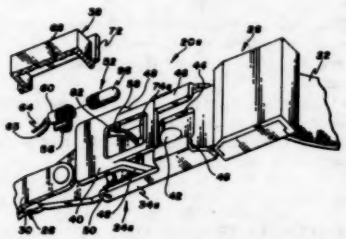
projections being spaced from the longitudinal edge of said structural element and from each other, said profile projections forming grooves which face each other along the length of said structural elements, and said profile projections having cutouts in the bottom of the grooves configured and dimensioned for receiving and detachably retaining said supporting element.

5,181,773

VEHICLE OCCUPANT RESTRAINT BELT BUCKLE INCLUDING ILLUMINATION

David S. Colvin, 23933 Haynes, Farmington Hills, Mich. 48024

Filed Mar. 28, 1991, Ser. No. 676,812
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—75 **13 Claims**



1. For use in a vehicle occupant restraint belt system including at least one belt portion for restraining a vehicle occupant, a buckle for detachably securing a keeper of the belt system to secure the belt portion across the occupant, said buckle comprising:

a hollow housing including a translucent portion that defines an exterior surface portion of the housing;

a latch member mounted within the housing for movement between latched and unlatched positions to detachably secure the keeper;

an electrically energized light source that is mounted within the housing and that, when energized, continuously provides illumination outwardly from the buckle housing through the translucent portion; and

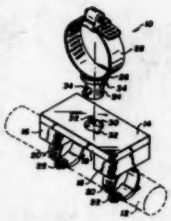
electrical connectors within the housing for connecting the light source to a power supply so as to thereby energize the light source and provide illumination through the translucent portion.

5,181,774

LAMP BRACKET

Lee Lane, 336 - 204 Westhill Place, Port Moody, B.C. V3H 1V2, Canada

Filed Jan. 8, 1992, Ser. No. 818,205
Int. Cl.[5] F21V *21/00*; F21L *7/00*
U.S. Cl. 362—72 **14 Claims**



1. A holder to allow temporary attachment of a lamp to a bicycle, the holder comprising:

a base having an underside;

means to attach the base to the bicycle;

a lamp holder to be removably attached to the base; and

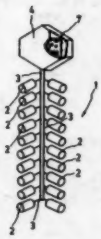
a releasable joint to attach the lamp holder to the base.

5,181,775

NON-POLLUTING FIRECRACKER DEVICE

Ching-Hwei Lan, No. 9, Alley 1, Lane 458, Yuang Ho Rd., Chung Ho City, Taiwan

Filed Jul. 12, 1991, Ser. No. 729,106
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—234 **2 Claims**



1. A non-polluting firecracker device comprising a control box;

a sound and light control circuit in said control box;

sound producing means to produce firecracker bursting sounds connected to said sound and light control circuit;

a power lead with positive and negative poles extending into said control box and connected to said sound and light control circuit;

a plurality of firecracker units in sets of two with each said set of two strung in series with said other sets along said power lead;

each said firecracker unit including

a casing in the shape of a firecracker formed of a plastic through which light penetrates,

a flash bulb within said casing having one lead connected to said positive pole and another lead connected to said negative pole of said power lead;

said sound and light control circuit including

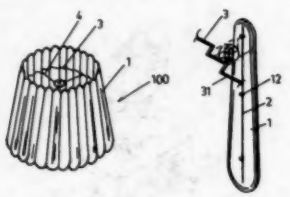
sequential means to fire said sets in sequence along said power lead in a direction toward said control box upon energization of said control circuit in accompaniment with firecracker bursting sounds from said sound producing means.

5,181,776

LAMP SHADE

Everette Tseng, P.O. Box 82-144, Taipei, Taiwan

Filed Oct. 22, 1991, Ser. No. 780,294
Int. Cl.[5] F21V *1/00*
U.S. Cl. 362—351 **1 Claim**



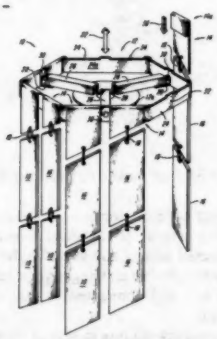
1. A lamp shade comprising:
- a plurality of leaves each having a smooth flange around a circumference and a plurality of aligned protuberances along a center line of an inner side thereof;
- a rod fixedly mounted on a center line of the inner side of each said leaf;
- a retainer having a recess at one side thereof and two grooves at the other side thereof, the recess of said retainer being engageable with one of said protuberances; and
- a fixing support having a plurality of teeth each engaged with one of the grooves of said retainer.

5,181,777

ASSEMBLY SYSTEM FOR A LIGHTING FIXTURE

William Segill, Newton; Mark E. Segill, Framingham, and Michael Dangelo, Seekonk, all of Mass., assignors to American Lighting Fixture Corp., Taunton, Mass.

Filed Apr. 24, 1991, Ser. No. 690,602
Int. Cl.[5] F21S *1/06*
U.S. Cl. 362—405 **13 Claims**



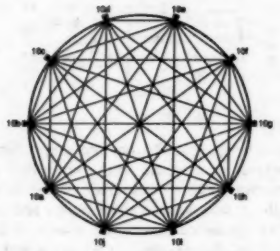
1. A system for mounting a plurality of free-hanging translucent members in three-dimensional array in conjunction with a source of illumination to form a suspended lighting fixture, comprising:
- a horizontally-extending support member formed of a strip of a structural material of generally rectangular cross-section oriented with the two narrow and surfaces at the top and bottom of the member;
- a plurality of mutually spaced, open recesses formed in the upper edge of said member and extending through said strip; and
- a plurality of attachment members having a hooked end portion adapted to seat in one of said recesses with a downward sliding movement and a body portion extending downwardly from said seated end portion, said body portion including means to attach to at least one of said translucent members and having a portion in a face-abutting relationship with an adjacent portion of said strip.

5,181,778

ULTRASONIC TOMOGRAPHY FOR IN-PROCESS MEASUREMENTS OF TEMPERATURE IN A MULTI-PHASE MEDIUM

Laurence S. Beller, Idaho Falls, Id., assignor to EG&G Idaho, Inc., Idaho Falls, Id.

Filed Sep. 30, 1991, Ser. No. 767,901
Int. Cl.[5] G01K *11/24*
U.S. Cl. 374—119 **10 Claims**



1. A method of determining the temperature throughout a multi-phase medium on the basis of speed of sound tomography, the steps comprising:
- establishing sectors throughout a cross-sectional portion of a multi-phase specimen;
- positioning ultrasonic transducers around the specimen such that multiple ultrasonic pulse flight paths traverse each established sector;
- transmitting multiple ultrasonic pulses by said ultrasonic transducers through each sector of the specimen;
- receiving said ultrasonic pulses which have travelled the established flight paths through said sectors of the specimen;
- identifying, measuring and recording the transit time of each ultrasonic pulse through said specimen;
- calculating the speed of sound through said sectors of the specimen;
- correlating a temperature in said sectors of the multi-phase specimen to said calculated speed of sound based upon established characteristics between speed of sound and temperature for said specimen.

5,181,779

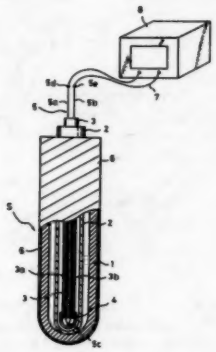
THERMOCOUPLE TEMPERATURE SENSOR AND A METHOD OF MEASURING THE TEMPERATURE OF MOLTEN IRON

Yoshiaki Shia; Hideaki Mori, both of Tokai; Otojiro Kida, Yokohama, and Hiroshi Taketsugu, Takasago, all of Japan, assignors to Nippon Steel Corporation and Asahi Glass Co., Ltd., both of Tokyo, Japan

PCT No. PCT/JP89/01189, § 371 Date Jul. 22, 1991, § 102(e) Date Jul. 22, 1991, PCT Pub. No. WO91/07643, PCT Pub. Date May 30, 1991
PCT Filed Nov. 22, 1989, Ser. No. 730,849
Int. Cl.[5] G01K *1/08*
U.S. Cl. 374—139 **12 Claims**

1. A thermocouple temperature sensor comprising a platinum-rhodium-based thermocouple having first and second metal wires, a connection point of the wires forming a heat sensing portion; an oxide insulation tube accommodating the metal wires, the heat sensing portion of the thermocouple being exposed from a front end portion of the insulation tube; a noble-metal cap mainly composed of platinum group metal

completely covering the front end portion of the insulation tube to thereby cover said heat sensing portion of the thermo-



couple; and a protecting tube made of metal-boride based ceramics accommodating the insulation tube and noble-metal cap.

5,181,780

ANTI-VIBRATION LINEAR MOTION GUIDE UNIT

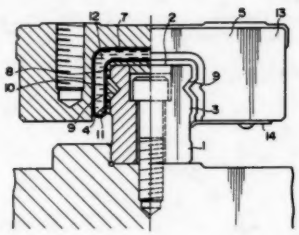
Kunihiko Morita, Koganei, Japan, assignor to Nippon Thompson Co., Ltd., Japan

Filed Feb. 11, 1991, Ser. No. 653,601

Claims priority, application Japan, Feb. 16, 1990, 2-35470

Int. Cl.[5] F16C *29/12*

U.S. Cl. 384—8 **8 Claims**



1. A sliding contact type linear motion guide unit, comprising:

a rail extending over a desired length including at least one guide surface and a first guiding means, wherein said first guiding means includes at least one guide groove formed in said rail extending in parallel with a longitudinal axis thereof;

a slider mounted on said rail to be movable relative to said rail therealong; and

a sliding member interposed between said rail and said slider, said sliding member including:

an elastic member having a first surface which is fixedly attached to said slider and a second surface opposite to said first surface; and

a contact member having a first contact surface which is fixedly attached to said second surface of said elastic member and a second contact surface which is in sliding contact with said at least one guide surface of said rail, wherein said contact member is formed with a second guiding means engageable with said first guiding means, wherein said second guiding means includes at least one ridge which can be fitted into said guide groove when assembled.

5,181,781

BALL CAGE FOR A TELESCOPIC RAIL, COMPRISING A CAGE BUFFER

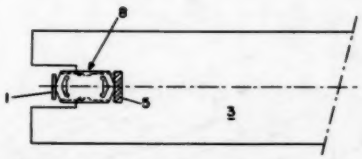
Hendricus T. Wojcik, Eijsden, Netherlands, assignor to Thomas Regout N.V., Maastricht, Netherlands

Filed Nov. 26, 1991, Ser. No. 799,049

Claims priority, application Netherlands, Nov. 26, 1990, 9002568

Int. Cl.[5] F16C *29/04*; A47B *88/00*

U.S. Cl. 384—21 **8 Claims**



1. A ball cage for a telescopic rail, comprising:

a plastic cage buffer mounted in a recess in a body of the ball cage, wherein the cage buffer comprises:

a stop member in abutment with a rear edge of the recess; and

a buffer member of a different material said buffer member comprising at least one spring chamber.

5,181,782

TELESCOPIC RAIL WITH LOCKING MECHANISM

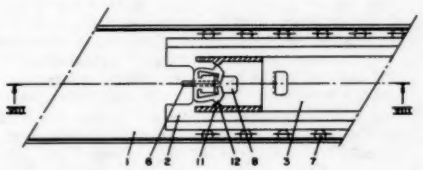
Thadeus H. Wojcik, Eijsden, Netherlands, assignor to Thomas Regout N.V., Maastricht, Netherlands

Filed Sep. 5, 1991, Ser. No. 755,327

Claims priority, application Netherlands, Sep. 6, 1990, 9001969

Int. Cl.[5] F16C *29.04*; A47B *88/00*

U.S. Cl. 384—21 **7 Claims**



1. A telescopic rail mainly consisting of three, substantially C-shaped sections of which the inner or drawer section (3) is slidably mounted in the intermediate section (2) with interposition of a first ball cage and the intermediate section (2) is slidably mounted in the outer or cabinet section (1) with interposition of a second ball cage (7), there being mounted at one end of the intermediate section (2) a stop block (5) with resilient fingers (13), which fingers (13) can be brought into a coupling position wherein the inner section (3) is coupled to the intermediate section (2) and into a pass position wherein the inner section (3) can move independently of the intermediate section (2), characterized in that the inner section (3) at one end thereof is provided with inwardly pointing projections (11) facing each other, while the resilient fingers (13) of the stop block (5) are fitted with outwardly pointing projections (12) facing away from each other, which projections (12) can be brought into the coupling position by means of a locking member (6) adapted to be slid between the free ends of the resilient fingers (13), in which coupling position the projections (12) of the resilient fingers (13) are disposed in the path of travel of the projections (11) of the inner section (3).

5,181,783

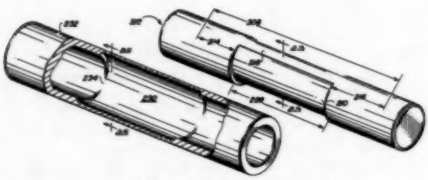
APPARATUS FOR ELIMINATING WHIRL INSTABILITY IN A GAS SUPPORTED BEARING

Randy J. Sherman, Phoenix, Ariz.; August O. Weilbach, La Habra, Calif.; Derald F. Hanson, and C. Dwight Smith, both of Phoenix, Ariz., assignors to Lincoln Laser Co., Phoenix, Ariz.

Continuation-in-part of Ser. No. 705,547, May 24, 1991, abandoned, which is a continuation of Ser. No. 568,416, Jul. 16, 1990, Pat. No. 5,019,738. This application Aug. 29, 1991, Ser. No. 752,017

Int. Cl.[5] F16C *32/06*

U.S. Cl. 384—114 **14 Claims**



1. A gas-supported bearing assembly comprising:

a. a cylindrical bearing sleeve having a longitudinal axis and a cylindrical inner surface including a first bearing surface;

b. a cylindrical bearing shaft positioned coaxially within the bearing sleeve, separated from the bearing by a gaseous medium, and having a cylindrical outer surface including a second bearing surface, wherein a relative rotational velocity is established between the bearing sleeve and the bearing shaft to generate a bearing supporting force through the gaseous medium along a bearing overlap zone where the first bearing surface overlaps the second bearing surface but is separated from the second bearing surface by the gaseous medium to form first and second spaced apart gas bearings, the bearing overlap zone having a defined length along the longitudinal axis; and

c. a pneumatic load ramp formed in one of the bearing surfaces creating a chamber between the first and second bearings and having a length along the longitudinal axis less than the length of the bearing overlap zone for generating a load in the gaseous medium within the camber to apply an asymmetric load through the gaseous medium in the chamber to the bearing assembly at a location fixed relative to either the sleeve or the shaft to eliminate bearing while instability, the first and second gas bearings restricting axial flow of the gaseous medium along the longitudinal axis into or out of the chamber.

5,181,784

ELASTIC SLIDING BEARING III

Ernst-Günter Jördens, Damme, and Hubert Siemer, Vechta, both of Fed. Rep. of Germany, assignors to Lemforder Metallwaren AG., Lemforder, Fed. Rep. of Germany

Filed Nov. 26, 1991, Ser. No. 798,493

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1990, 4037966

Int. Cl.[5] F16C *17/10*

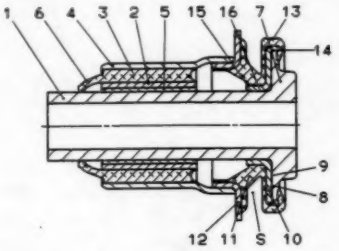
U.S. Cl. 384—222 **6 Claims**

1. An elastic sliding bearing for vehicle parts in motor vehicles, comprising:

an inner bushing having an axially outer end with a radially directed inner bushing flange projection;

an outer bushing arranged in an elastomeric body, said elastomeric body firmly adhering to said outer bushing, said outer bushing having a radially directed outer bushing flange projection providing an axial bearing surface at an axially outer end, said inner bushing being rotatably arranged in said outer bushing;

a mounting bushing, said elastomeric body being non-rotatably inserted into said mounting bushing, said mounting bushing being axially movably connected to said outer bushing flange projection by an elastomeric intermediate member, said elastomeric intermediate member providing



a cross-section, in the axial direction, by which restoring forces are built up in an elastomeric material of said elastomeric intermediate member, said restoring forces increasing with increasing axial displacement of said inner bushing in relation to the outer bushing.

5,181,785

SLEEVE BEARING

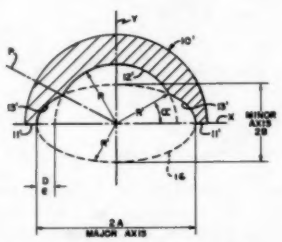
Durval Bencini, and Mario S. Da Silva Praca, both of Sao Paulo - SP, Brazil, assignors to Metal Leve S.A. Industria E Comercio, Sao Paulo, Brazil

Continuation-in-part of Ser. No. 514,003, Apr. 25, 1990, abandoned. This application Oct. 17, 1991, Ser. No. 777,899

Claims priority, application Brazil, Apr. 26, 1989, PI 8902442

Int. Cl.[5] F16C *17/02*

U.S. Cl. 384—288 **10 Claims**



1. A bearing halfshell for use with internal combustion engine connecting rods, said halfshell having a central plane of symmetry, a pair of diametrally opposed ends located on a bearing parting plane and an inner sliding surface of substantially constant radius centered on said parting plane, said constant radius surface extending in opposite directions from the central plane of symmetry to two end regions of said inner surface located one on each side of the central plane of symmetry, each said end region beginning at a respective radial plane which defines an angle with the bearing parting plane, the bearing inner surface being defined between each one of said radial planes and the end located on the same side of the central plane of symmetry, by a non-circular curved surface portion having a radius of curvature gradually increasing as said non-circular surface portion extends in the direction away from the central plane of symmetry to thereby produce an eccentricity ϵ on the respective end regions of the inner surface.

5,181,786

METHOD AND APPARATUS FOR PRODUCING ADMISSION TICKETS

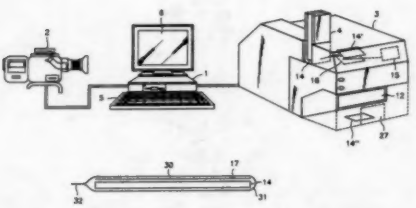
Hendrik W. Hujink, Aalten, Netherlands, assignor to N.V. Nederlandsche Apparatenfabriek Nedap, De Groenlo, Netherlands

Filed Nov. 15, 1990, Ser. No. 612,697

Claims priority, application Netherlands, Nov. 15, 1989, 8902818

Int. Cl.[5] B41J *5/30*; **B42D** *15/10*

U.S. Cl. 400—61 **15 Claims**



1. Method for producing admission tickets having electromagnetically stored and detectable information and visual information thereon containing identification data of the holder of the admission ticket, comprising:

providing a first carrier containing electromagnetically detectable information;

providing a second carrier containing visual information;

placing said first and second carriers together in overlying unbonded relationship;

placing an at least partly transparent sleeve element around said overlying carriers in unbonded relationship therewith; and

sealing said transparent sleeve to completely enclose said overlying carriers, so that said transparent sleeve is removable to facilitate modification of at least one of said carriers and reuse thereof by resealing said first and second carriers in another of said transparent sleeve elements.

5,181,787

THERMAL LINE PRINTER HAVING A ROTATABLE HEAD HOLDING MEMBER

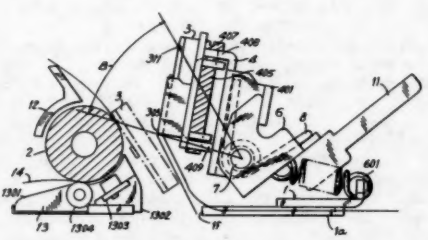
Hiroaki Hosomi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jun. 25, 1991, Ser. No. 720,312

Claims priority, application Japan, Jun. 26, 1990, 2-67554; Jun. 26, 1990, 2-67555; Jun. 26, 1990, 2-167382; Jun. 26, 1990, 2-167383; Mar. 28, 1991, 3-64868

Int. Cl.[5] B41J *2/32*

U.S. Cl. 400—120 **27 Claims**



1. A thermal line printer comprising a frame;

a platen rotatably mounted on said frame;

a thermal head;

head holding means pivotably mounted on said frame for holding said thermal head and pivotably displaces said thermal head between a first position, a second position and a third position;

first lever means for cooperating with said head holding means for moving the thermal head between said first position and second position;

a pivotable auxiliary member contacting with said head holding means;

biasing means for biasing said thermal head toward said platen and said auxiliary member away from said head holding means;

second lever means coupled to said auxiliary member for locking said auxiliary member in a predetermined position; and

said second lever being operatively coupled to the auxiliary member so that movement of said second lever unlocks said auxiliary member, and permits said thermal head to move from said second position to said third position.

5,181,788

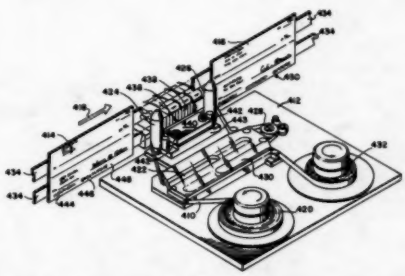
RIBBON SAVING CONTROL MECHANISM

Thomas J. Norman, Jr., Richardson; James R. Ingram, Jr., Dallas, and Joel Y. Lin, Denton, all of Tex., assignors to BanTec, Inc., Dallas, Tex.

Continuation of Ser. No. 338,868, Apr. 17, 1989, abandoned, which is a continuation of Ser. No. 20,444, Mar. 2, 1987, abandoned. This application Feb. 15, 1991, Ser. No. 657,247

Int. Cl.[5] B41J *33/51*

U.S. Cl. 400—232 **2 Claims**



1. An encoding apparatus for depositing discrete series of characters on documents transported through the apparatus, comprising:

a document transport mechanism for engaging a document and transporting it through the encoding apparatus along a document pathway;

a die set fixed to the apparatus and having characters extending from a surface thereof along a portion of one side of the document pathway;

a plurality of striking elements fixed to the apparatus in opposing relationship to the characters of the die set on the other side of the document pathway and disposed for striking documents in the document pathway in response to control signals;

a single-strike, ink-bearing ribbon interposed between the striking elements and characters of the die set; drive means selectively transporting a portion of the ribbon along the document pathway either in the same direction and at the same speed as the document transported through the apparatus or in a reverse direction with respect to the document transport direction;

means responsive to the encoding of the chronologically last character in a particular series of characters for determining a length of ribbon to be transported in said reverse direction before a subsequent series of characters is encoded;

means controlling the drive means to stop and reverse the drive means after the chronologically last character in the particular series of characters is encoded a linear distance substantially equal to said determined length, the ribbon being reversed to a ribbon position where encoding of the subsequent series of characters will begin in a portion of the ribbon substantially adjacent to a portion of the ribbon consumed in printing the first series of characters; and

said drive controlling means reverses the ribbon a variable reverse distance after printing the particular series of characters on a document, said drive controlling means determining the reverse distance by the formula:

Reverse Distance=MAX (Striking Element Number+Character Position Number)−String Length,

where String Length is the total number of characters in the particular series of characters printed,

Striking element Number is a number between one and the total number of striking elements used in printing the particular series of characters, and

Character Position Number is a number between one and the total number of characters in the particular series of characters.

5,181,789

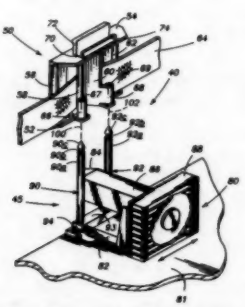
PRINTER RIBBON GUIDE ASSEMBLY

Blaise G. Blair, Post Falls, Id., assignor to Output Technology Corporation, Spokane, Wash.

Filed Jun. 21, 1991, Ser. No. 718,631

Int. Cl.[5] B41J *35/04*

U.S. Cl. 400—248 **13 Claims**



1. A computer printer ribbon guide assembly for a printer having at least one print head, the printer ribbon guide assembly comprising:

a ribbon guide for coupling to and defining a path for an exposed print section of a print ribbon; and

guide support means mounted adjacent to, but spaced from, a nose section of the print head, the support means having at least one supporting element;

the ribbon guide having fastening means in an installation direction, for releasibly securing the ribbon guide to the supporting element so that the ribbon guide is held in a fixed position in front of the nose section of the print head.

5,181,790

DISPLAY AND APPLICATOR CONTAINER FOR WAXY PRODUCTS

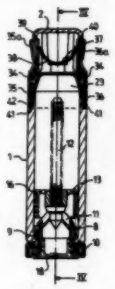
Marthe Lucas, 22 allée des Fauvettes, 34280 La Grande Motte, Hérault, France

Filed Nov. 22, 1991, Ser. No. 796,446

Claims priority, application France, Nov. 30, 1990, 90 15039

Int. Cl.[5] A45D *40/04*

U.S. Cl. 401—75 **13 Claims**



1. A display and applicator container for waxy products which are solid at room temperature comprising:

(i) a body of substantially oval shape in cross-section comprising:

a bearing surface;

an aperatured piston contained in said body;

a bottom;

an open sheath defined by said bottom for introduction of a waxy material through said aperatured piston, whereby said waxy material is molded into a cake against an inner wall of said body and a cover;

a cover; and

a driving member for said aperatured piston, said open sheath is closed by said driving member and said waxy material is isolated from ambient atmosphere by said cover and said driving member;

(ii) a cap capable of being tightly closed comprising: fixation members comprised of a yoke having a resiliently deformable bottom, and legs having operating buttons and small bars formed by ends thereof, said body including ribs which cooperate with said small bars for securing the cap on the body said cover fitted inside said cap by centering and latching means;

(iii) a sealing gasket, formed by said cover and being in correspondence with said bearing surface of said body; and

(iv) an annular housing defined by said cover and formed from an inner rib and fitting over a lip of said body, said inner rib being defined by a tapered inner wall of said cover.

5,181,791

APPLICATOR FOR APPLYING SEALANT FOR ELECTROCHEMICAL CELL

Walther G. Grot, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

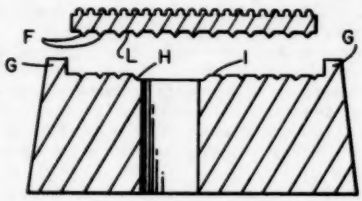
Division of Ser. No. 511,180, Apr. 17, 1990, abandoned. This application Oct. 4, 1991, Ser. No. 770,783

Int. Cl.[5] B05C *17/00*

U.S. Cl. 401—266 **4 Claims**

1. An applicator for applying a sealant to a ribbed gasket which comprises a means of providing a controlled flow of the sealant through an orifice in an applicator head, the head having a face modified in a means to provide a controlled size bead of the sealant near the center of the gasket and the face of the applicator is grooved in a manner to mate with the ribs of the gasket as a means of guiding the applicator on the gasket

and minimizing deposition of sealant where not desired and wherein a section of the face extends from the orifice parallel



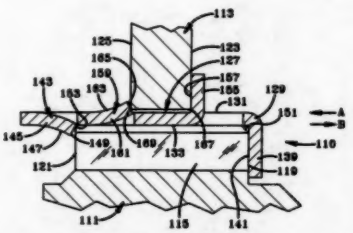
to the grooves having a deeper section into which the sealant is urged.

5,181,792

RETAINER FOR SPLINED MEMBERS

Edwin T. Grochowski, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 13, 1992, Ser. No. 850,736
Int. Cl.[5] B25G *3/28*
U.S. Cl. 403—359 **6 Claims**



1. A retainer for releasably securing a splined radially innermost rotatable member to a splined radially outermost rotatable member in order to preclude relative axial displacement between the radially innermost and the radially outermost rotatable members, said retainer comprising:

a body portion;

a first stop surface presented from said body portion to engage one of said rotatable members and thereby preclude relative axial movement between said body portion and said one rotatable member in one axial and directional frame of reference;

a first dog extending outwardly from said body portion to engage said same rotatable member engaged by said first stop surface and thereby preclude relative axial movement between said body portion and said one rotatable member in the opposite axial and directional frame of reference;

a second stop surface presented from said body portion to engage the second of said rotatable members and thereby preclude relative axial movement between said body portion and said second rotatable member in one axial and directional frame of reference;

a second dog extending outwardly from said body portion to engage said second rotatable member and thereby preclude relative axial movement between said body portion and said second rotatable member in the opposite axial and directional frame of reference;

said dogs being adapted releasably to engage said rotatable members;

said first stop surface is presented from a first flange extending substantially orthogonally outwardly from said body portion;

said first dog is disposed in axially spaced relation from said first flange to embrace one of the rotatable members therebetween;

said body portion is substantially planar;

said first dog is unitary with and bent outwardly from said substantially planar body portion; and

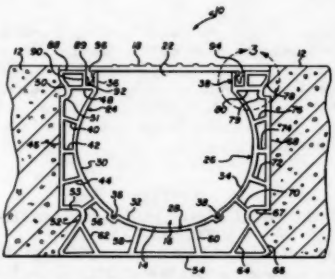
said first dog has a modulus of elasticity which permits said first dog to be forcibly depressed so as to lie within said substantially planar body portion but which will cause said first dog to spring outwardly from said substantially planar body portion upon the release of said depressing force.

5,181,793

GUTTER DRAIN APPARATUS

Joseph Dekel, 4532 Jubilo Dr., Tarzana, Calif. 91356

Filed Dec. 24, 1990, Ser. No. 633,012
Int. Cl.[5] E01C *11/22, 11/02;* E04D *13/00*
U.S. Cl. 404—4 **8 Claims**



1. Gutter drain apparatus for emplacement in concrete decking for draining liquids from the surface thereof, said gutter being subject to inward pressure upon expansion of said concrete decking, said gutter drain apparatus comprising:

a drainage trough adapted to be installed below grade in said decking and having an open top, said trough having side walls, and first retaining means including a lip portion on said side walls;

a cap member for covering said open top of said trough, said cap member having second retaining means including a hook portion for cooperation with said lip portion of said first retaining means for detachably latching said cap member on said trough,

protection means for forming a spacing for protecting said first and second retaining means from the effects of said inward pressure to maintain said cap member on said trough without diminishing the removability of said cap member notwithstanding said inward pressure; and

wherein said protection means comprises a U-shaped groove formed at the top of each of said side walls, said U-shaped groove being bounded by a first wall section contiguous to said open top, a second wall section spaced outwardly from said first wall section and an interconnecting section extending between the first and second wall sections, and wherein said first retaining means is situated on the outward side of said first wall section.

5,181,794

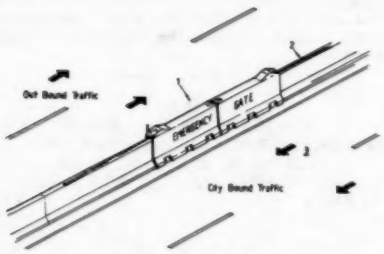
REMOVABLE BARRIER

James B. S. Wilson, Vermont; Peter M. Serle, Mount Waverley, and Zdenek Siroky, Hampton, all of Australia, assignors to Roads Corporation, Victoria, Australia

Filed Jan. 10, 1991, Ser. No. 639,803
Claims priority, application Australia, Jan. 18, 1990, PJ8229
Int. Cl.[5] E01F *13/00*
U.S. Cl. 404—6 **15 Claims**

1. A retractable barrier adapted to cooperate with an intermediate passageway in a fixed median barrier serving as a

partition between a first traffic lane and a second traffic lane, said retractable barrier being adapted to move between an open position and a closed position whereby said intermediate passageway is either open to permit traffic to move through said passageway between said traffic lanes when said passageway is open or is closed to prevent traffic movement through



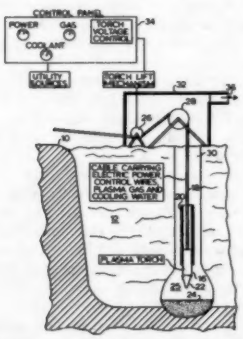
said passageway; said retractable barrier comprising at least one movable barrier member nd fixed holding means arranged in said intermediate passageway to which said at least one barrier member is retained to resist vehicle impact when said retractable barrier is in said closed positions and acting as a guide during movement of said at least one barrier member towards said closed position.

5,181,795

IN-SITU LANDFILL PYROLYSIS, REMEDIATION AND VITRIFICATION

Louis J. Circeo, Jr., 4245 Navajo Trail, Atlanta, Ga. 30319, and Salvador L. Camacho, 8913 O'Neal Rd., Raleigh, N.C. 27612

Filed Aug. 19, 1992, Ser. No. 931,962
Int. Cl.[5] E02D *3/00, 3/11*
U.S. Cl. 405—128 **13 Claims**



1. A method for in-situ treatment and remediation of waste materials collected in a landfill by means of a plasma torch having appropriate connected utilities, comprising:

(a) forming a borehole of a size sufficient to accommodate a plasma torch and extending from an upper end to a lower end at a predetermined depth below the landfill's top surface and passing through waste materials collected in the landfill;

(b) lowering a plasma torch with connected utilities into said formed borehole and suspending the torch at a location above and proximate said borehole lower end;

(c) utilizing the connected plasma torch utilities to operate said torch to create a plasma arc flame of sufficient temperature to pyrolize, remediate and vitrify, substantially in the absence of combustion, said waste materials located proximate said plasma arc flame, thus forming a molten mass, and permitting any resultant by-product gases to rise in said formed borehole;

(d) collecting said by-product gases for treatment and recycling;

(e) deenergizing the torch and stopping production of said plasma arc flame;

(f) removing the plasma torch with its connected utilities from the borehole; and

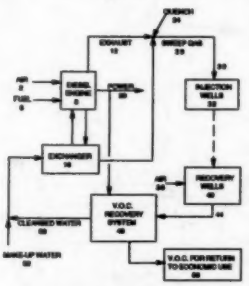
(g) allowing said molten mass to cool and solidify thereby to produce a column of remediated and vitrified waste material which volume is substantially less than the volume of waste material from which the vitrified column was produced.

5,181,796

METHOD FOR IN SITU CONTAMINANT EXTRACTION FROM SOIL

Scott H. DeYoung, 51 Caudatowa Dr., Ridgefield, Conn. 06877

Filed Jul. 11, 1991, Ser. No. 728,610
Int. Cl.[5] E02D *3/11*
U.S. Cl. 405—128 **20 Claims**



THERMALLY ENHANCED SOIL VENTING
V.O.C. MITIGATION / RECOVERY PROCESS

1. A method for the in situ removal of volatile contaminants from contaminated soil comprising the steps of:

injecting hot exhaust gas from an internal combustion engine into and through said contaminated soil thereby volatilizing a portion of said volatile contaminants and

removing a volatile organic chemical containing gas from said soil while said soil remains in situ.

17. A structure for the in situ removal of volatile contaminants from soil comprising:

an internal combustion engine generating exhaust gas;

means for injecting said exhaust gas into said contaminated soil; and

means for removing a volatile organic chemical containing gas from said soil while said soil remains in situ.

5,181,797

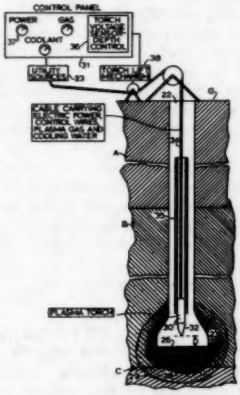
IN-SITU SOIL STABILIZATION METHOD AND APPARATUS

Louis J. Circeo, Jr., 4245 Navajo Trail, Atlanta, Ga. 30319, and Salvador L. Camacho, 8913 O'Neal Rd., Raleigh, N.C. 27612

Filed Jan. 29, 1992, Ser. No. 827,384
Int. Cl.[5] E02D *3/11*
U.S. Cl. 405—131 **23 Claims**

1. A method for solidifying a mass of earth to form a structural column comprising: (a) forming a hole to a predetermined distance into said mass of earth; (b) inserting a plasma arc torch into said formed hole; (c) energizing by applying a voltage to said torch to create a source of plasma arc heat sufficient to melt substantially in the absence of combustion a portion of said earthen mass; (d) while maintaining said torch energized,

raising said torch out of said hole coordinated with the changing level of melt in said hole; deenergizing said torch; and (f)



allowing said molten mass of earth to cool and said melt to solidify to form a structural column therefrom.

5,181,798

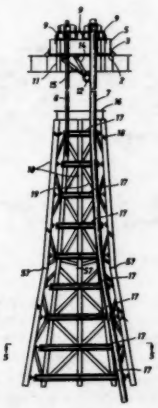
DOUBLE PIPE TURNTABLE AND STINGER

Robert T. Gilchrist, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 13, 1991, Ser. No. 759,327

Int. Cl.[5] F16L *1/12*

U.S. Cl. 405—170 **18 Claims**



1. An apparatus for supporting a plurality of pipes from a ship comprising:

a) a horizontal circular rotatable turntable which can rotate relative to the ship, and from which the plurality of pipes may be suspended into water;

b) a stinger which is symetrical about a vertical axis, the stinger being fixed to the ship and not rotatable with the turntable and located below the rotatable turntable, with an inside diameter large enough to pass the plurality of pipes, and fluted outward as it extends downward; and

c) a means to support the plurality of pipes essentially vertically from the turntable against an inner diameter of the stinger.

5,181,799

OFFSHORE SUPPORT STRUCTURE APPARATUS

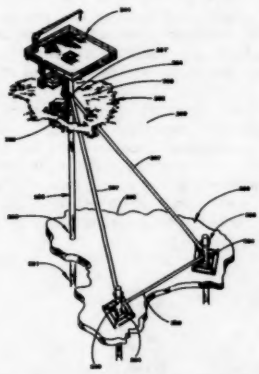
Samuel C. Carruba, Fulshear, Tex., assignor to CBS Engineering, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 503,704, Apr. 3, 1990, Pat. No. 5,026,210. This application Nov. 2, 1990, Ser. No. 608,382

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[5] E02B *17/00*

U.S. Cl. 405—195.1 **14 Claims**



1. A support structure for use with a well located in a body of water, the well having an upstanding conductor pipe having upper and lower ends, extending from the ground below the body of water to, above the surface of the water, comprising:

only two tubular legs, each leg having upper and lower ends and adapted to extend from the ground to at least the surface of the water;

a pile skirt fixedly secured to each of the two legs, at the lower end of each of the two legs; and

at least one pile skirt bracing member extending between and connecting the two pile skirts;

means for connecting the upper ends of each of the two legs to the conductor pipe, the two legs being radially spaced from one another, the connection means being adapted to be disposed upon the conductor pipe at least at the surface of the water or higher, whereby the two legs and connection means can be secured at their upper ends to the conductor pipe and the lower ends of the legs can be moved downwardly into contact with the ground.

5,181,800

MINE ROOF ANCHOR HAVING ADJUSTABLE RESIN RETAINING WASHER

John C. Stankus, Canonsburg; Eugene H. Stewart, Pittsburgh, and Glen S. Grissinger, Hollidaysburg, all of Pa., assignors to Jennmar Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 702,147, May 13, 1991, abandoned, which is a continuation of Ser. No. 389,620, Aug. 3, 1989, abandoned, which is a continuation of Ser. No. 229,699, Aug. 8, 1988, Pat. No. 4,865,489. This application Dec. 24, 1991, Ser. No. 813,943

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] E21D *20/02*

U.S. Cl. 405—259.6 **24 Claims**

1. A roof anchor for supporting an underground mine roof or the like comprising:

an elongated shaft having first and second end portions operable to be positioned in a bore hole in a mine roof having an open end portion at said mine roof and a blind closed end portion in the strata above said mine roof;

said shaft first end portion being arranged to be inserted and secured within said bore hole formed in said roof by a preselected volume of a resin bonding material inserted in said bore hole in capsule form above said shaft front end portion, at least a portion of said resin bonding material arranged to be mixed in said bore hole by rotation of said shaft to set said resin and bond said shaft first end portion to the inner wall of said bore hole;

said shaft second end portion having means cooperating therewith operable to bear against said mine roof at said open end portion of said bore hole;

annular stop means positioned on said elongated shaft for exerting a compressive force on said preselected volume of said resin bonding material positioned thereabove in said bore hole, said annular stop means movable to a preselected position along the length of said elongated shaft,

positioning means engaged to said elongated shaft below said annular stop means for locating said annular stop means at a preselected location along the length of said shaft so that upon insertion of said shaft first end portion in said bore hole said annular stop means is axially fixed on said shaft to exert pressure on said resin bonding material before said resin bonding material has been mixed by said shaft and set, and

said annular stop means arranged to maintain a compressive force on said resin bonding material while said bonding material is mixed and further maintains said compressive force on said preselected volume of said resin bonding material while said resin bonding material sets and after said bonding material has set.

17. A method of supporting an underground mine roof or the like comprising:

forming a blind bore hole upwardly in a mine roof, said blind bore hole having a wall and a closed blind end portion in the strata above the mine roof;

inserting into said blind bore hole a preselected volume of a resin bonding material contained in a substantially unmixed condition within a destructible resin capsule with components of said resin bonding material being confined within separate compartments of said capsule;

providing a roof anchor which includes a shaft with first and second end portions, an annular stop means on said shaft intermediate said first and second end portions and a bolt head on said second end portion;

adjusting the position of said annular stop means along the length of said roof anchor shaft to a preselected location on said shaft between said first and second end portions to provide a volume of space between said stop means on said shaft and said closed blind end portion of said bore hole that is not occupied by said roof anchor and is less than the volume of said resin bonding material in said capsule;

inserting said roof anchor first end portion in said blind bore hole and moving said first end portion upwardly in said blind bore hole toward said closed blind end portion,

fracturing said resin capsule and said separate compartments therein with said roof anchor shaft first end portion while urging said roof anchor upwardly in said bore hole to trap said resin in a substantially unmixed condition between said bore hole blind end portion and said annular stop means to put pressure on said resin before said resin hardens;

rotating said roof anchor to mix said components of said resin bonding material within said bore hole while compressing said resin between said bore hole blind end portion and said annular stop means; and

maintaining said resin compressed while said resin hardens and sets.

5,181,801

DEVICE FOR ACTUATING A TILTING LEVER USED IN SENSING SHEET-TYPE RECORDING MEDIA

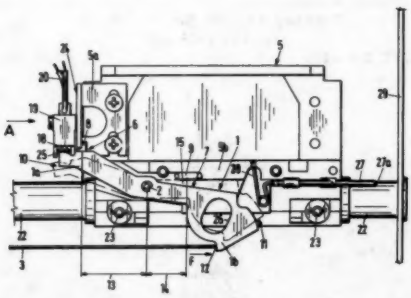
Egon Durler, Mönchweiler, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 11, 1990, Ser. No. 595,612

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1989, 3934398

Int. Cl.[5] **B41J** *29/42*

U.S. Cl. 400—708 **10 Claims**



1. A device for actuating a tilting lever used in sensing a sheet-type recording medium, comprising:

a frame;

a tilting lever having first and second arms extending in a longitudinal direction of said tilting lever and a pivot axis attached to said frame, said tilting lever being swingably mounted about said pivot axis between a first reference position and a second reference position; means directing the sheet-type recording medium in a path which intersects said tilting lever in one of its first or second positions;

a first permanent magnet having a magnetic force cooperating with a first magnetized contact region on said first tilting-lever arm and arranged to rest against said magnetized contact region when said first tilting-lever arm is in said first reference position; and

a second permanent magnet having a magnetic force cooperating with a second magnetized contact region on said second tilting-lever arm and arranged to rest against said second contact region when said second tilting-lever arm is in said second reference position,

wherein the respective distances from said first and second permanent magnets to said pivot axis in longitudinal direction of said tilting lever are selected such that unequal torques of sufficiently large magnitude exist between said first and second permanent magnets and said first and

second tilting-lever arms, respectively, such that said tilting lever can be displaced from at least one of said first and second reference positions in responce to a driving force exerted by the sheet-type recording medium on said tilting lever and then shifted to said other reference position.

5,181,802

OIL COLLECTOR

Norvald Thengs, Ekrestubben 4, N-4040 Hafrsfjord, and John D. Olsen, Jonas Liesgo 4, N-4021 Stavanger, both of Norway

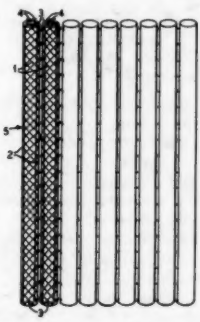
PCT No. PCT/NO89/00109, § 371 Date Apr. 26, 1991, § 102(e) Date Apr. 26, 1991, PCT Pub. No. WO90/04683, PCT Pub. Date May 3, 1990

PCT Filed Oct. 23, 1989, Ser. No. 678,979

Claims priority, application Norway, Oct. 27, 1988, 884779

Int. Cl.[5] E02B *15/04*

U.S. Cl. 405—70 **12 Claims**



1. An absorbent oil collector to be used as an oil spill combating apparatus, comprising:

a stocking of liquid-permeable material;

an oil-absorbent material encased within said stocking

wires inserted along diametrically opposite sides of said stocking and at both end portions of the stocking, and

coupling means attached along one longitudinal wire and to the wire at one end portion of the stocking in order to allow joining of a plurality of stockings—wherein each stocking, thus, constitute a module—forming a mat of any desired size, and which through rolling may be transformed into a section of a boom of any desired thickness, said coupling means being adapted to cooperate with wires inserted into other modules.

5,181,803

METHOD OF MAKING DAILY COVER FOR A LANDFILL

R. Paul Smith, McLean, Va., and Michael I. Price, Upper Marlboro, Md., assignors to Recovermat Technologies, Inc., Washington, D.C.

Filed Apr. 20, 1992, Ser. No. 871,103

Int. Cl.[5] B02C *15/00*; C04B *18/06*

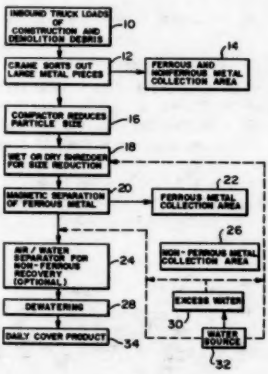
U.S. Cl. 405—129 **13 Claims**

1. A method of making daily cover for a landfill comprising the steps of:

providing a supply of construction and demolition debris;

adding water to said debris; and

processing said debris through a shredder so as to produce a moist shredded product having an average particle size



and a moisture content sufficient to permit use of said product as daily cover for a landfill.

5,181,804

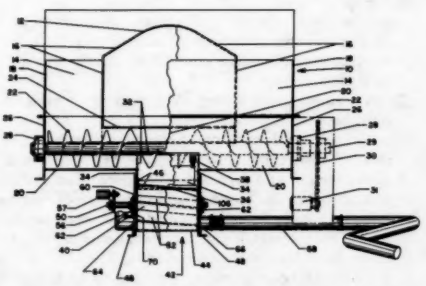
APPARATUS FOR CONVEYING AND DISCHARGING BULK MATERIALS

Douglas E. Wysong, Middletown, and Joseph A. Bedel, Cincinnati, both of Ohio, assignors to Finn Corporation, Fairfield, Ohio

Filed Nov. 27, 1991, Ser. No. 800,167

Int. Cl.[5] B65G *53/08*

U.S. Cl. 406—67 **6 Claims**



1. An apparatus for conveying and discharging bulk material comprising

a hopper feeder assembly having a diverter dividing said hopper;

a trough mounted generally below said hopper assembly;

a converging screw conveyor mounted within said trough;

a means for driving said screw conveyor;

an opening in the bottom of said trough;

a transition area located beneath said opening;

a rotary air valve located beneath said transition area;

a means for driving said rotary air valve;

said rotary air valve having a material inlet, a central shaft with multiple vanes mounted at a five to ten degree angle to the axis of said shaft defining pockets between said vanes;

at least one cutting means positioned on a mounting shelf along the longitudinal axis of said material inlet;

said rotary air valve having an air inlet and an air outlet, said outlet offset from said inlet by the angle of said vane so

that air fed through said inlet is channeled through said pocket to said outlet;

a means for conveying bulk material from said outlet of said rotary valve;

and a means for supplying pressurized air to said air inlet.

5,181,805

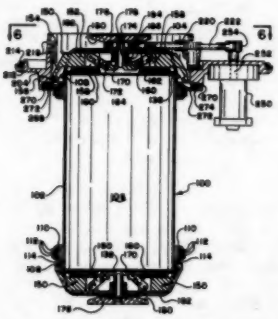
PNEUMATIC TUBE SYSTEM

Leo J. Grosswiller, East Canton; F. Michael Theriault, Canton; Lawrence F. Mannella, and Walter G. Anders, both of North Canton, all of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Division of Ser. No. 621,015, Nov. 30, 1990, Pat. No. 5,131,792. This application Feb. 3, 1992, Ser. No. 830,142

Int. Cl.[5] B65G *51/06*

U.S. Cl. 406—189 **12 Claims**



1. A carrier for use in a cylindrical pneumatic tube system, the carrier being a generally cylindrical, normally closed container for transporting articles through the system, the carrier comprising:

a generally cylindrical, tubular body symmetrical about a central axis, said body having opposed open ends communicating with an interior cavity for holding said articles to be transported;

flange means formed about the periphery of each of said open ends of said body:

a pair of removable caps, one cap mounted on one open end and the other cap mounted on the other open end of said body, each of said caps being dimensioned to correspond to said one or the other of said open ends of said carrier body, and having an axis oriented to generally correspond to said central axis of said body when said cap is mounted thereon, each of said caps including:

a plurality of latch elements operable to grip said flange means, each of said latch elements movable along an individual path perpendicular to said axis of said cap between an attached position wherein said latch elements engage said flange means and secure said cap to said carrier body and a release position wherein said latch elements are disengaged from said flange means wherein said cap may be removed from said carrier body,

an actuator movable along the axis of said cap between a first position and a second position,

link means operable to connect said actuator to said plurality of latch elements, said latch elements being in said attached position when said actuator is in said first position and being in said release position when said actuator is in said second position, and

means for biassing said actuator toward said first position; and

means for pneumatically sealing at least one of said caps with said tubular body when said at least one of said caps is in said attached position.

5,181,806

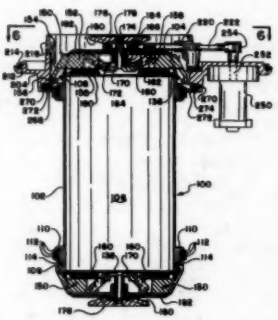
PNEUMATIC TUBE SYSTEM

Leo J. Grosswiller, East Canton; F. Michael Theriault, Canton; Lawrence F. Mannella, and Walter G. Anders, both of North Canton, all of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Division of Ser. No. 621,015, Nov. 30, 1990, Pat. No. 5,131,792. This application Feb. 3, 1992, Ser. No. 830,148

Int. Cl.[5] B65G *51/06*

U.S. Cl. 406—189 **7 Claims**



1. A cap for attachment to a generally tubular container having a cavity, an opening to said cavity and a flange about the periphery of said opening, said cap including:

a cap housing dimensioned to generally correspond to said opening in said container;

a cover member attached to said housing for enclosing said opening in said tubular container;

means about the periphery of said cover member for pneumatically sealing said cavity when said cap is attached to said container;

a plurality of latch elements mounted to said housing, each of said latch elements including a hook shaped protrusion dimensioned to engage said flange and being movable along an individual path which is generally perpendicular to a predetermined axis to reciprocate between an attached position wherein said hook shaped projections are disposed to engage and grip said flange on said container and a release position wherein said latch elements have moved outward away from said axis and said hook shaped projections are removed from said flange;

an actuator movable along said axis between a first position and a second position, and

link means operable to connect said actuator to said plurality of latch elements, said latch elements being in said attached position when said actuator is in said first position and being in said release position when said actuator in said second position.

5,181,807

FLOATING ACCELERATOR RING

Walter G. Anders, North Canton, Ohio, assignor to Diebold, Incorporated, Canton, Ohio

Filed Sep. 24, 1991, Ser. No. 764,755

Int. Cl.[5] B65G *51/06*

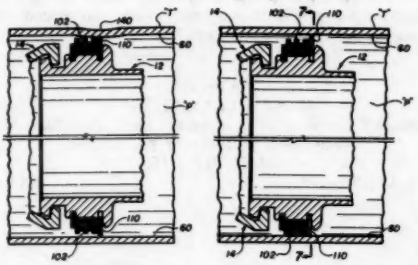
U.S. Cl. 406—190 **19 Claims**

13. A carried for use in pneumatic transfer systems for carrying loads through a cylindrical passage in an elongated transfer tube, said transfer tube having an inner surface of predetermined diameter defining said passage, said carrier comprising:

a generally cylindrical tubular body symmetrical about a central axis, said body having an outer facing external surface and an inner cavity for containing articles to be transferred, and

at least one stationary accelerator ring positioned on the

external surface of said carrier extending radially outward from said external surface, said at least one stationary accelerator ring being circular and dimensioned to have an outer diameter less than the diameter defining said passage of said transfer tube, said at least one stationary accelerator ring being fixedly mounted to said tubular body and being stationary with respect to said central axis of said tubular body,



at least one circular floating accelerator ring which extends radially outward from said body having an outer diameter larger than outer diameter of said at least one stationary accelerator ring, and

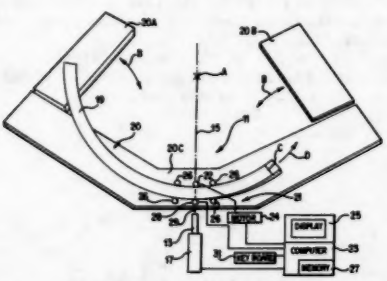
means for mounting said floating accelerator ring on said carrier such that said floating accelerator ring is capable of moving laterally with respect to the central axis of the carrier.

5,181,808

METHOD AND APPARATUS FOR AUTOMATED DRILLING HOLE PATTERNS IN ELONGATED WORKPIECES

R. Lamar Griggs, Acworth, and Norman E. Hatton, Marietta, both of Ga., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Sep. 18, 1991, Ser. No. 761,583
Int. Cl.[5] B23B *35/00*
U.S. Cl. 408—1 R **5 Claims**



5. A method of forming a predetermined hole pattern to be drilled in an elongated workpiece, the method comprising the steps of:

affixing a template, having markings indicating each hole sites of a given hole pattern, to a workpiece holder for supporting an elongated workpiece for movement relative to a drill having a drill bit;

moving the workpiece holder relative to the drill;

visually aligning each hole site marked on the template with the drill bit;

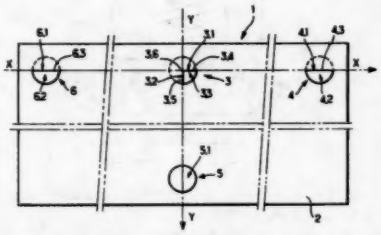
storing the position of the workpiece holder at each hole site in a memory means.

5,181,809

BENCHMARK DEVICE FOR A PLANE FACE, AND A MACHINING SYSTEM IMPLEMENTING IT

Guy E. Martin, Colomiers, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Oct. 24, 1991, Ser. No. 782,316
Claims priority, application France, Oct. 24, 1990, 90 13181
Int. Cl.[5] B23B *49/02*
U.S. Cl. 408—3 **11 Claims**



7. A system enabling a member to be brought to a precise location of an object linked to a plane face, said plane face occupying a fixed position that is different from but adjacent to a nominal position, wherein:

said member is carried by a moving support capable of moving in translation along three orthogonal axes and capable of rotating about two perpendicular axes, said movable support being movable with respect to said three orthogonal axes;

said plane face being positioned with respect to said three orthogonal axes;

said movable support accordingly being movable with said respect to said plane face;

said moving support carries a distance detector;

said system includes three benchmark elements which are carried by said plane face and which are such that:

the first benchmark element includes a rectangular trihedron with two facets that are orthogonal to said plane face and a third facet of said trihedron being parallel to said plane face such that one of the edges of said trihedron is perpendicular to said plane face and the other two edges of said trihedron are parallel to said plane face;

the second benchmark element includes a rectangular dihedron whose facets are respectively orthogonal and parallel to said plane face, such that the edge of said dihedron is parallel to said plane face, and

the third benchmark element includes a facet parallel to said plane face; and

said benchmark elements are disposed on said plane face in such a manner that;

they are not in alignment;

the facets of said three benchmark elements that are parallel to said plane face are coplanar; and

said edge of said second benchmark element is collinear with one of the two edges of said first benchmark element that are parallel to said plane face.

5,181,810

DEBURRING TOOL WITH CUTTING BLADE

Heinrich Heule, Kristallstrasse 6, Au, Switzerland

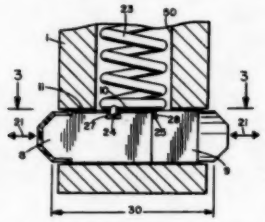
Continuation of Ser. No. 437,936, Nov. 16, 1989, abandoned. This application Jun. 11, 1991, Ser. No. 713,724
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1988, 3839423; European Pat. Off., Oct. 2, 1989, 89118358
Int. Cl.[5] B23B *51/10*
U.S. Cl. 408—147 **11 Claims**

1. A deburring tool for removing burrs on through holes, comprising:

at least one elongate cutter body of generally rectangular cross-section having a forward axial end;

a rotatable tool holder mounted for movement in a tool feed direction and having a guide recess transverse to the feed direction for mounting said cutter body;

the forward axial end of said cutter body comprising a non-



cutting axial end surface extending generally perpendicular to said guide recess;

said cutter body having a non-cutting, glide surface extending rearwardly at a first angle from said axial end surface, and at least one cutting edge extending rearwardly from the glide surface at a second, different angle relative to said axial end surface.

5,181,811

DRILL AND DRILL GRINDING METHOD AND APPARATUS

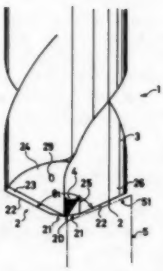
Toshiaki Hosoi, 9-10, Kamiminami 5-chome, Hiranoku, Osaka-shi, Osaka-fu, Japan

Filed Jun. 26, 1989, Ser. No. 371,469

Claims priority, application Japan, Jul. 4, 1988, 63-167479

Int. Cl.[5] B23B *51/02*

U.S. Cl. 408—230 **14 Claims**



1. A drill having an axis of rotation comprising a pair of symmetrically arranged cutting edges formed at one end of a shank, said shank having an outer periphery, each of said cutting edges having a flank followed by a land with a first land portion and a second land portion on opposite sides of a demarcation line and further followed by a discharge flute when viewed from said one end of said shank, each of said cutting edges comprising a central edge portion extending from said axis of rotation and an outer edge portion each extending substantially straight and being joined to each other with an obtuse angle formed therebetween when seen from the direction of feed of the drill, said central edge portion being formed with a central face substantially parallel to the axis of the drill, said first land portion of one of said cutting edges extending from said flank in a direction opposite the direction of rotation of said drill to said demarcation line, said second land portion having an outer end section extending from said outer periphery of said shank and an inner end section extending from said axis of rotation, said inner end section extending from said demarcation line to the central face of the central edge portion of the other symmetrical cutting edge, a phantom cutting plane extending parallel to the axis of the drill and extending substantially perpendicularly through an intermediate part of said central edge portion, said first land portion and said second land portion being intersected by said cutting plane, said cutting plane intersecting said second land portion at a first line of intersection, said first line of intersection being disposed at a first angle relative to said central face, said cutting plane intersecting said first land portion at a second line of intersection, said second line of intersection when continued by a phantom line to said central face being disposed at a second angle relative to said central face, said second angle being greater than said first angle.

5,181,812

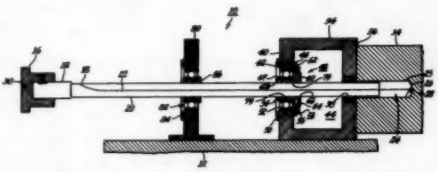
GUN DRILL MECHANISM

Richard T. Labinka, 137 Southwyck, Chagrin Falls, Ohio 44022

Filed Dec. 19, 1991, Ser. No. 810,191

Int. Cl.[5] B23B *47/00*

U.S. Cl. 408—234 **5 Claims**



1. Guide means for a gun drill rotatably mounted in a supported bearing structure which consists essentially of a cylinder body member of resilient organic polymer having a non-round central opening extending therethrough and which further includes radially extending multidiameter flange means at one end which enables a smaller diameter flange portion to engage the bearing end face by direct physical contact therewith while a larger diameter flange portion extends beyond to engage the end face of the bearing support by direct physical contact therewith and thereby cooperate to provide a more effective seal means reducing bearing failure.

5,181,813

SPLIT RING LEVER CLAMPING ARRANGEMENT

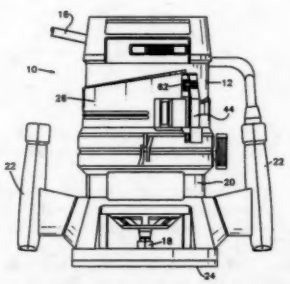
Robert E. McCracken, Easley, S.C., assignor to Ryobi Motor Products Corp., Easley, S.C.

Filed Nov. 15, 1991, Ser. No. 792,653

The portion of the term of this patent subsequent to Dec. 24, 2008, has been disclaimed.

Int. Cl.[5] B23C *1/20*

U.S. Cl. 409—182 **6 Claims**



1. In a router including a motor housing having an external cylindrical portion, said cylindrical portion having a first longitudinal region with a substantially smooth surface and a

second longitudinal region having an external screw thread, a base having a cylindrical bore for slidably receiving therein said first longitudinal region of said motor housing cylindrical portion, and an adjustment ring including means for engaging said screw thread on said motor housing and means for rotationally engaging said base, said adjustment ring being split with an opening between two opposed ends;

clamp means for releasably securing said adjustment ring to said motor housing and said base so as to maintain the position of said base relative said motor housing, comprising:

a first projection formed on said adjustment ring adjacent a first one of said opposed ends and extending substantially radially outwardly from said adjustment ring, said first projection being formed with a first through-bore extending substantially parallel to a tangent to said adjustment ring at said first opposed end;

a second projection formed on said adjustment ring adjacent the second one of said opposed ends and extending substantially radially outwardly from said adjustment ring, said second projection being formed with a second through-bore extending substantially parallel to a tangent to said adjustment ring at said second opposed end, said second through-bore being substantially aligned with said first through-bore when said opposed ends are closely adjacent each other;

a first camming surface on said first projection facing away from said second projection;

a clamp member having a second camming surface slidably engaging said first camming surface; and

holding means extending through said first and second through-bores for engaging said clamp member and holding said first projection between said second projection and said clamp member so that movement of said clamp member in a first direction draws said first and second projections toward each other and movement of said clamp member in a second direction allows said first and second projections to separate;

whereby movement of said clamp member may be effected by an operator for selectively securing and releasing said adjustment ring with respect to said motor housing and said base.

5,181,814

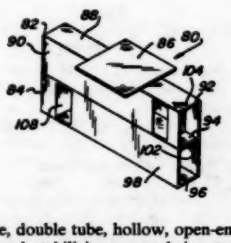
FOLDING VOID FILLER

James L. Woods, and Robert F. Thomasino, both of 4120 Brighton Blvd., Unit A-23, Denver, Colo. 80216

Division of Ser. No. 468,188, Jan. 22, 1990, Pat. No. 5,102,272. This application Nov. 4, 1991, Ser. No. 787,118

Int. Cl.[5] B61D *45/00*; B63B *25/24*; B65D *81/04*

U.S. Cl. 410—122 **3 Claims**



1. A one-piece, double tube, hollow, open-ended void filler for supporting and stabilizing cargo being transported in a vehicle, said double tube void filler being used to fill spaces between stacked loads making up the cargo, the double tube void filler being capable of being folded to a partially assembled, flat-configuration for storage and shipping and quickly opened to an expanded configuration for use, the one-piece, double tube, open-ended void filler comprising:

a) a first elongated, hollow, open-ended, foldable tube having an upper surface, one side surface and a lower surface, said first tube having a longitudinal axis and each of said upper, lower and side surfaces being connected along individual fold lines forming longitudinal edges of the surfaces, said upper and lower surfaces having sufficient compressive strength to support cargo loads when the void filler is in use;

b) a second elongated, hollow, open-ended, foldable tube, having an upper surface, one side surface and a lower surface, said second tube having a longitudinal axis and each of said upper, lower, and side surfaces being connected along individual fold lines forming longitudinal edges of the surfaces, said upper and lower surfaces of said second tube having sufficient compressive strength to support the cargo loads when the void filler is in use;

c) said first and second tubes having a one-piece, common side panel which is opposite the side surfaces of said first and second tubes, said common side panel having an upper edge and a lower edge and a height which is the same as the combined height of the side surfaces of the first and second tubes, the upper and lower edges of the common side panel being connected along longitudinal fold lines to a free edge of the upper and lower surfaces of the first and second tubes, respectively;

d) said lower surface of the first tube and the upper surface of the second tube being overlapped and fixedly attached by suitable fastening means;

e) each of said void filler tubes having at least two separate folding panels, each of said folding panels being formed on different outer surfaces of the respective tube, said folding panels having a size which is the same as the interior cross-section of the individual respective tube, one edge of each folding panel is a fold line arranged parallel to an end edge of the respective tube, said folding panels being arranged to fold inwardly across the interior of the respective tube to a position perpendicular with the upper, lower and side surfaces and said common side panel so as to contact these surfaces to hold the tube in a reinforced expanded configurations so as to hold the cargo load in place while the void filler is in use; and

f) a flange attached to the top surface of the first tube to support the void filler between the cargo loads.

5,181,815

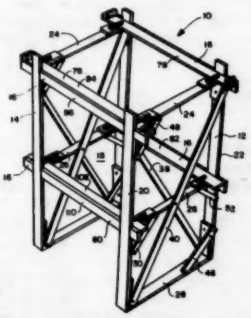
COLLAPSIBLE STRUCTURE FOR UNITIZING AND BRACING A LOAD IN A TRAILER

Robert W. Haberkorn, 8100 W. 119th St., Palos Park, Ill. 60464

Filed Nov. 1, 1990, Ser. No. 607,819

Int. Cl.[5] A47F *5/00*

U.S. Cl. 410—140 **6 Claims**



1. A collapsible bracing structure for bracing a load against shifting on a surface bearing the load, the collapsible bracing structure comprising:

a pair of laterally spaced frames extending in parallel on the load bearing surface, each frame having a pair of upright

members connected by a plurality of vertically spaced transverse members;

an elongated cross brace extending between the frames and releasably connected therewith to define a rigid parallelepiped for bracing a load,

the cross brace being a generally L-shaped member having a substantially horizontal leg and a substantially vertical leg, said substantially horizontal leg contacting and resting on a transverse member on each frame when the bracing structure is assembled, said substantially vertical leg having a first notch engaged with one of the upright members of one side frame and a second notch engaged with one of the upright members of the other side frame whereby each upright member engaged with the substantially vertical leg fits within the corresponding notch to prevent lateral separation of the side frames; and

a latch on at least one of the side frames and movable into overlying engagement with the substantially horizontal leg for maintaining engagement of the cross brace with the upright members.

5,181,816

REMOVABLE ANCHOR TUBE ASSEMBLY

James H. Walsh, P.O. Box 924, Longmont, Colo. 80502

Filed Oct. 26, 1990, Ser. No. 605,822

Int. Cl.[5] F16B *13/06*

U.S. Cl. 411—60 **2 Claims**

1. An expanding anchor assembly comprising a tubular sleeve having a bore through its entire length and parallel elongated slots at one end forming plural, resilient and radially expandable tabs, wherein each tab includes an internal protrusion spaced a predetermined distance from the tab's free end; and an axially movable, elongated expansion activating plug located in said bore and of a length equal to or less than said predetermined distance and a diameter that allows movement within the bore toward said one end; said movement resulting in interference with the protrusions causing radial outward expansion of the tabs, while continued movement past the protrusions allows the tabs to radially contract inward and frictionally retain the expansion activating plug in the contracted tabs.

5,181,817

FASTENER

George E. Anderson, Champlin, Minn., assignor to Crown Iron Works Company, Minneapolis, Minn.

Filed Sep. 25, 1991, Ser. No. 765,123

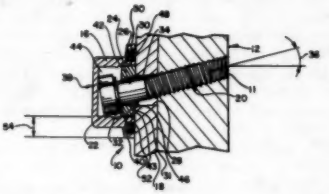
Int. Cl.[5] F16B *33/00*

U.S. Cl. 411—369 **5 Claims**

1. A fastener for securing an attachment to an inner surface of a wall confining a fluid, wherein the attachment has an internally-threaded aperture formed therein to receive an externally-threaded boss passing through an aperture in the wall registered with the aperture and the attachment, comprising:

(a) a hardened washer having a central aperture formed therethrough and threads formed in an outer peripheral surface thereof, said washer aperture being defined, along its full axial length as it extends through an axial dimension of said hardened washer, by a conical surface wherein said aperture, when said hardened washer is in engagement with the outer surface of the fluid-confining wall, has a larger diameter at an end of said aperture more closely proximate the outer surface of the fluid-confining wall, and said washer aperture being registrable with the aperture in the fluid-confining wall when said washer is brought into engagement with an outer surface of the wall;

(b) a bolt including the externally threaded boss and a head at one end of said boss having a diameter larger than said aperture formed in said hardened washer, said boss of said bolt being able to be passed through said aperture in said hardened washer and the aperture in the liquid-confining wall and threaded into the internally-threaded aperture formed in the attachment when the hardened washer is in engagement with the outer surface of the fluid-confining



wall to tighten the attachment securely against the inner surface of the fluid-confining wall; and

(c) a cap having a cylindrical chamber formed therewithin, said chamber having a defining wall, internally threaded compatibly with threads formed in said outer peripheral surface of said hardened washer, wherein said cap is able to be threaded tightly against the outer surface of the fluid-confining wall when the attachment is tightly secured to the inner surface of the fluid-confining wall wherein said washer aperture defines, when said boss of said bolt is passed therethrough, a widening annular space between said conical surface defining said aperture and said boss of said bolt, and further comprising an annular elastomeric seal receivable within said space, wherein as said bolt is tightened down, said elastomeric seal is compressed to more efficiently seal and interface between said hardened washer and the fluid-confining wall.

5,181,818

METHOD FOR SHIFTING GOODS AND APPARATUS THEREFOR

Nobuhiro Tanaka, Saitama; Hirotoshi Tawara, and Eiji Hirata, both of Koshigaya, all of Japan, assignors to KAO Corporation, Tokyo, Japan

Division of Ser. No. 341,856, Apr. 24, 1989, Pat. No. 5,020,965. This application Mar. 20, 1991, Ser. No. 672,339

Claims priority, application Japan, Apr. 28, 1988, 63-106168; Jul. 21, 1988, 63-182050; Nov. 21, 1988, 63-151583; Dec. 26, 1988, 63-167860; Jan. 23, 1989, 1-6305; Jan. 24, 1989, 1-14776; Jan. 26, 1989, 1-16927; Jan. 30, 1989, 1-20584

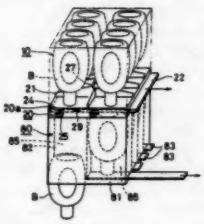
Int. Cl.[5] B65G *65/23*

U.S. Cl. 414—414 **22 Claims**

1. A goods take-out apparatus for taking out a predetermined number of goods from a container containing a plurality of goods, said apparatus comprising:

a goods take-out tool including partitions for separating the goods contained in the container according to the storing states thereof, the goods being provided in a plurality of rows and columns in the take-out tool; and

shutter means for sequentially taking out a desired number of goods one by one by receiving the goods separated by the



goods take-out tool and thereafter releasing the goods one by one.

5,181,819

APPARATUS FOR PROCESSING SEMICONDUCTORS

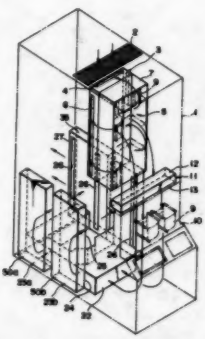
Kazunari Sakata, Sagamihara; Katsumi Ishii, Kanagawa, and Kenichi Yamaga, Sagamihara, all of Japan, assignors to Tokyo Electron Sagami Limited, Kanagawa, Japan

Filed Oct. 8, 1991, Ser. No. 772,836

Claims priority, application Japan, Oct. 9, 1990, 2-273027; Oct. 17, 1990, 2-278576; Oct. 17, 1990, 2-278577

Int. Cl.[5] B65G *25/00*

U.S. Cl. 414—217 **10 Claims**



1. A semiconductor processing apparatus comprising:

a main body having an air passage;

at least first and second filter units connected in series to said air passage in said main body, said first filter unit having a first air outlet port, first air blowing means and a first air intake port structured so as to take, into said main body, air flowing inside a room in which said semiconductor processing apparatus is installed, said second filter unit being disposed downstream of said first filter unit and having second air blowing means, a second air outlet port and a second air intake port communicating with said first air outlet port of said first filter unit;

exhausting means for exhausting air passed through said first and second filter units outside said main body; and

means for arranging articles to be processed close to said air outlet port of each of said first and second filter units such that air is supplied to said articles to be processed after said air has passed through said first or second filter unit.

5,181,820

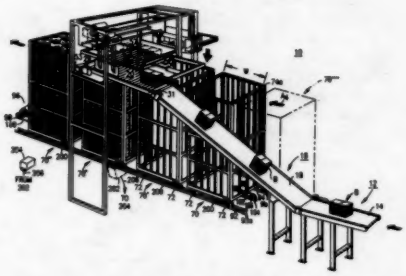
AUTOMATIC BUNDLE LOADING APPARATUS AND METHOD

Christer A. Sjogren, Miami, and Kevin Cote, Fort Lauderdale, both of Fla., assignors to Quipp Systems, Inc., Miami, Fla.

Filed Mar. 27, 1991, Ser. No. 676,192

Int. Cl.[5] B65G *1/10*

U.S. Cl. 414—331 **39 Claims**



1. Apparatus for automatically loading a cart comprised of a platform surrounded by sidewalls and having an open top, at least one of said sidewalls having a plurality of vertically aligned elongated clearance slots;

said apparatus comprising:

a loading station for receiving and positioning said cart;

means for receiving bundles to be loaded into said cart;

conveyor means adjacent said receiving means for conveying the bundles received from said receiving means to a location a predetermiend height above an open end of said cart at said loading station;

a platform assembly for receiving bundles from said conveyor means;

said platform assembly being comprised of a plurality of sections;

means for selectively advancing bundles along said sections including means to halt the advancing of bundles on each section responsive to detection of a bundle on said section;

pusher means responsive to the presence of bundles upon predetermiend ones of said sections for pushing said bundles in a transverse direction onto a split platform means;

said split platform means comprising first and second platform sections movable between a closed position wherein adjacent edges of said platform sections are in close proximity and an open position wherein said sections are moved apart to define a gap region between said split platform sections;

said gap region being positioned immediately above the open end of said cart; and

means responsive to delivery of bundles by said pusher means upon said split platform assembly for moving said split platform sections apart whereupon the bundles resting thereon are dropped through said gap region toward said cart.

5,181,821

BRAKE DRUM SUPPORT APPARATUS

Connie L. King, Sr., HC2 Box 6719, Pipe Creek, Tex. 78063-9524

Filed Jun. 17, 1991, Ser. No. 716,268

Int. Cl.[5] B60B *30/10*

U.S. Cl. 414—427 **4 Claims**

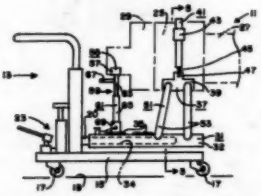
3. A brake drum support apparatus for use with a wheel dolly and a vehicle having a brake drum and a wheel hub attached tos aid brake drum, and for supporting said brake drum and said wheel hub as said brake drum is removed from said vehicle; said wheel dolly having a first arm member and a second arm member and having jack means for allowing said

first and second arm members to be raised and lowered; said brake drum support apparatus comprising:

(a) base means for being attached to said wheel dolly; said base means including a first frame member having an aperture therein for receiving said first arm member of said wheel dolly and including a second frame member having an aperture therein for receiving said second arm member fo said wheel dolly and for allowing said base means to be raised and lowered with said first and second arm members of said wheel dolly;

(b) drum cradle means for cradling said brake drum of said vehicle while said brake drum is removed from said vehicle;

(c) drum cradle brace means for attaching said drum cradle means to said base meansand for allowing said drum cradle means to be raised and lowered with said first and second arm members of said wheel dolly;



(d) hub cradle means for cradling said wheel hub of said vehicle as said brake drum is removed from said vehicle; and

(e) hub cradle brace means for attaching said hub cradle means to said base means; said hub cradle brace means including hub cradle jack means for allowing said hub cradle means to be raised and lowered; said hub cradle jack means including a rod member having a first end for being attached relative to said hub cradle means and having a threaded second end, and including a threaded member for being attached relative to said base means and for coacting with said threaded second end of said rod member so that rotation of said rod member relative to said base means will cause said hub cradle means to be raised and lowered.

5,181,822

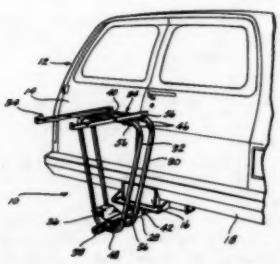
ARTICULATED SUPPORT RACK FOR VEHICLES

Ivor J. Allsop, Bellingham; Harold F. Holz, Linden, and Eivind Clausen, Bellingham, all of Wash., assignors to Allsop, Inc., Bellingham, Wash.

Continuation-in-part of Ser. No. 397,693, Aug. 23, 1989, abandoned. This application Sep. 26, 1990, Ser. No. 587,061

Int. Cl.[5] B60R *9/08*

U.S. Cl. 414—462 **34 Claims**



5. An articulated support rack for attachment to the rear of a vehicle having a bumper with a top edge, comprising:

a base member adapted for attachment to the rear of the vehicle;

at least two upwardly extending support frame members pivotally attached to said base member to pivot between a raised position adjacent the vehicle and a lowered position spaced away from the vehicle;

at least one horizontal mounting arm attached to said support frame members to remain substantially horizontal as said support frame members move between said raised and lowered positions; and

a locking assembly attached to said base member including a lock plate for releasably engaging at least one of said support frame members to secure said support frame members in said raised position, a restraining member connected to said lock plate for preventing disengagement of said plate from said at least one support frame member, and a lever pivotally attached to said base member for selectively disengaging said lock plate from said at least one support frame member, wherein said locking assembly is located below the bumper top edge.

5,181,823

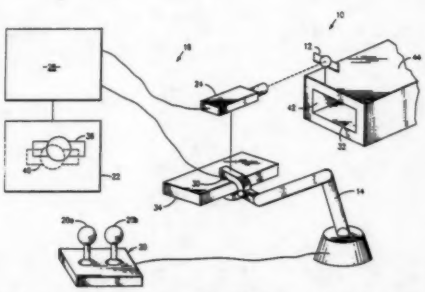
APPARATUS AND METHOD FOR PRODUCING A VIDEO DISPLAY

John P. Hussey, Setauket; Richard M. Green, Bronx, and Saul L. Keslowitz, Bayside, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 27, 1989, Ser. No. 428,234

Int. Cl.[5] B25J *9/00*

U.S. Cl. 414—730 **10 Claims**



7. Apparatus for moving an article into a selected position, comprising:

a target located a given distance from and a given orientation relative to the selected position;

a moveable mechanical arm;

video display means;

a video camera connected to the video display means to produce a picture of the target thereon;

means to connect the video camera to the article for movement therewith, and to hold the video camera said given distance from and said given orientation relative to the article;

graphics display means connected to the video display means to generate on the video display means an outline of the target;

arm control means connected to the mechanical arm to operate the mechanical arm to grip and to carry the article into the selected posit on; and

sensing means to sense forces on the article and to generate a signal indicating the magnitude of the sensed forces; and

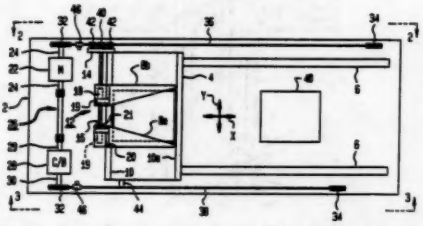
wherein the graphics display means is connected to the sensing means to receive said signal therefrom, and is adapted to generate on the video screen a graphical display illustrating the magnitude of the sensed forces.

5,181,824

VARIABLE WIDTH AND LENGTH HOLDING AND SIZE SEBSUBG DEVICE FOR A DUAL AXIS TRANSLATION MECHANISM

Howard C. Thomas, Westminister, Colo., assignor to Eureka Acquisition Corp., Arlington Heights, Ill.

Filed Nov. 21, 1990, Ser. No. 616,478
Int. Cl.[5] B65G *35/00*
U.S. Cl. 414—751 33 Claims



1. A mechanism for selective grasping and translation of an object to a position defined by first and second axes, comprising:

a frame;

a carriage mounted on said frame via a first guide means for movement of said carriage with respect to said frame along a first axis;

a holder for selectively grasping said object;

intermediate mounting means coupled with said holder and said carriage for mounting said holder on said carriage via a second guide means for movement of said holder with respect to said carriage along a second axis which is different from said first axis;

a motor means for selectively driving a first belt;

a drive/brake assembly coupled to said motor means for selectively driving a second belt which, in a drive mode of said assembly is driven synchronously with said first belt and, which in a brake mode of said assembly is held non-driven while said first belt is being driven; and

said first belt being coupled to the second guide means of said intermediate mounting means for selectively moving said object holder in a direction parallel to said second axis in response to movement of said first belt and said second belt being coupled with said carriage for selectively moving said carriage in a direction parallel to said first axis in response to movement of said second belt; wherein,

said object holder comprises first and second clamp arms;

the second guide means of said intermediate mounting means comprises a lead-screw having an end coupled to receive rotational movement from said first belt, and carries first and second nuts thereon, which nuts are coupled to said first and second clamp arms, respectively; and

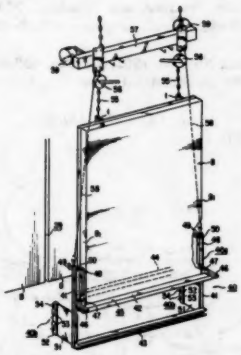
said first nut being threaded onto the lead screw and non-rotatably attached to the first clamp arm for preventing rotation of the first nut with respect to the first clamp arm, and said second nut being rotatably attached to the second clamp arm for permitting the second nut to at least selectively rotate with respect to the second clamp arm, whereby the spacing between said clamp arms is selectively controlled to cause said clamp arms to grasp and thereafter translate said object along said second axis.

5,181,825

METHOD FOR LIFTING AND GUIDING ELEMENTS ON BUILDING SITE

Yoshihisa Sugitani, Osaka, and Isamu Matsubara, Toyama, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 642,135, Jan. 15, 1991, abandoned, which is a continuation of Ser. No. 440,253, Nov. 22, 1989, abandoned. This application Oct. 7, 1991, Ser. No. 774,726
Claims priority, application Japan, Nov. 28, 1988, 63-298052
Int. Cl.[5] E04G *21/14*
U.S. Cl. 414—786 2 Claims



2. A method for mounting building panels onto a building, comprising the steps of:

mounting first building panels on a lower portion of a side of the building spaced from one another to define joint spaces between said first building panels, said joint spaces extending vertically along the side of the building and substantially parallel to one another;

guiding second building panels up the side of the building along said joint spaces between said first building panels, including the substeps of:

extending a guide member into said joint spaces, said guide member being movable along said joint spaces;

rolling guide rollers along exterior surfaces of said first building panels on either side of said joint spaces as said second building panels are guided up the building; and

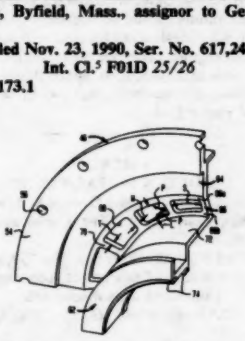
hooking said second building panels onto lateral members on the building above said first building panels.

5,181,826

ATTENUATING SHROUD SUPPORT

Peter J. Rock, Byfield, Mass., assignor to General Electric Company

Filed Nov. 23, 1990, Ser. No. 617,244
Int. Cl.[5] F01D *25/26*
U.S. Cl. 415—173.1 10 Claims



1. A turbine shroud support comprising:

an annular mounting flange having a radially outer end fixedly mountable to a casing, and a radially inner end;

an annular hanger spaced radially inwardly from said mounting flange for supporting a turbine shroud;

an annular coupling fixedly joining said mounting flange to said hanger, and including a plurality of circumferentially spaced apertures defining a plurality of beams therebetween, said beams being sized and configured for reducing axial force and axial moment transmitted from said mounting flange to said hanger for attenuating radial distortion transmitted to said hanger from said mounting flange.

5,181,827

GAS TURBINE ENGINE SHROUD RING MOUNTING

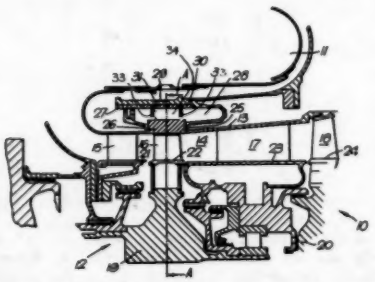
Terence R. Pellow, Watford, and Ronald A. Midgley, Weston-on-Trent, both of England, assignors to Rolls-Royce plc, London, England

Filed Nov. 30, 1982, Ser. No. 450,440

Claims priority, application United Kingdom, Dec. 30, 1981, 8139038

Int. Cl.[5] F01D *11/08*

U.S. Cl. 415—173.3 **6 Claims**



1. A turbine for a gas turbine engine, said turbine having a turbine casing, means cooperating with said turbine casing to define an annular gas passage, a stage of rotary aerofoil blades positioned within said annular passage and having an axis of rotation, a shroud ring made from a ceramic material surrounding and spaced from said aerofoil blades, said shroud ring being capable of floating radially with respect to said axis of rotation, said turbine casing being axially divided radially outwardly of said stage to define a circumferentially extending housing accommodating said shroud ring and additionally defining an annular chamber with an outer wall spaced radially outwardly of said shroud ring, and means radially supporting and radially spacing apart said shroud ring from said turbine casing, the improvement in said last-mentioned means comprising:

a pair of axially spaced apart flanges extending radially inwardly from said outer wall toward said shroud ring and defining an annular space surrounding said shroud ring;

and a woven wire mesh array located within and filling said space between said outer wall and said shroud ring and between said axially spaced apart flanges, said flanges being capable of restraining said woven wire mesh array from axial movement.

5,181,828

MOLTEN METAL PUMP

Ronald E. Gilbert, Chardon, and George S. Mordue, Ravenna, both of Ohio, assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Nov. 22, 1991, Ser. No. 797,465

The portion of the term of this patent subsequent to Feb. 18, 2009, has been disclaimed.

Int. Cl.[5] F04D *29/44, 29/54;* F01D *25/24*

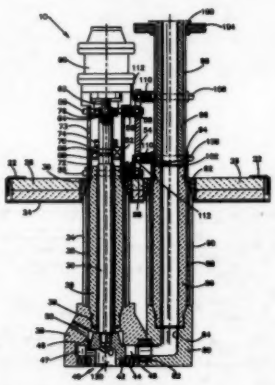
U.S. Cl. 415—200 **23 Claims**

1. A molten metal pump, comprising:

an elongate, hollow, refractory post having first and second ends, the first end adapted to extend out the molten metal and the second end adapted to extend into the molten metal;

an elongate drive shaft disposed within the post for rotation therein, the drive shaft having first and second ends, the first end adapted to extend out of the first end of the post and the second end adapted to be disposed adjacent the second end of the post;

an impeller connected to the second end of the drive shaft;



a stator connected to the second end of the post, the stator including a cavity within which the impeller is disposed, an inlet into which molten metal can be drawn and an outlet through which molten metal can be discharged, the impeller being spaced from the stator; and

means for conveying gas between the outer surface of the drive shaft and the inner surface of the post, and thereafter through the space between the impeller and the stator.

5,181,829

HELICOPTER BLADE

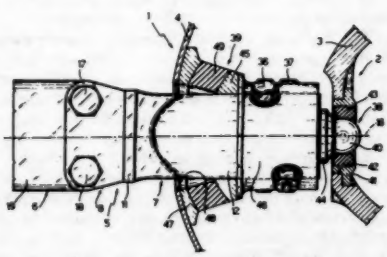
Santino Pancotti, Gallarate, Italy, assignor to Agusta S.p.A., Samarate, Italy

Filed Apr. 5, 1991, Ser. No. 681,135

Claims priority, application Italy, Apr. 6, 1990, 67 260 A/90

Int. Cl.[5] B64C *27/48*

U.S. Cl. 416—134 A **5 Claims**



1. A helicopter blade **(5)(50)** comprising a connecting device **(7)(51)** for connecting the blade **(5)(50)** to a hub **(2)** of a rotor **(1)**; the connecting device **(7)(51)** being made of composite synthetic material, and comprising a tubular end portion **(12)** and first and second connecting means **(38)(39)** for connecting said tubular portion **(12)** to the hub **(2)**; said first connecting means **(38)** comprising a rod **(44)** housed inside said tubular portion **(12)**, and two first diametrical through pin means **(36, 37)** offset along said rod **(44)** and each engaging a pair of first holes **(20*a*, 20*b*)(21*a*, 21*b*)** formed through said tubular portion

(12) for connecting the rod (44) to the tubular portion (12); the second connecting means (39) comprising a tubular body (46) coaxial with and fitted on to the tubular portion (12) with said first pin means (36, 37) extending through the tubular body (46); and the connecting device further comprising, for each said first hole (20*a*, 20*b*)(21*a*, 21*b*), a substantially axial strap (28, 29, 30, 31) (53, 54, 55, 56) of synthetic fiber material looped about said first hole (20*a*, 20*b*)(21*a*, 21*b*).

5,181,830

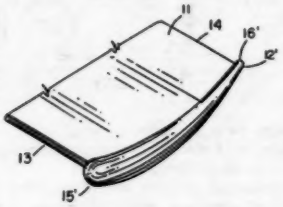
BLADE FOR AXIAL FLOW FAN

Rudy S. Chou, 87 Ingleside La., Liverpool, N.Y. 13090

Filed Nov. 21, 1991, Ser. No. 796,514

Int. Cl.[5] F01D *5/14*

U.S. Cl. 416—223 R **1 Claim**



1. An enhanced blade (11) for an axial flow fan, said blade having

a leading edge (13),

a trailing edge (14) and

a tip having a tip contour that is an arc of the circle that defines the swept area of said fan,

the enhancement comprising:

a rounded body (12') extending from said blade tip from said leading edge to said trailing edge, conforming to said tip contour and having

a generally circular longitudinal cross section,

a faired leading end (16') and faired trailing end (15') and

a cross sectional area that increases from said leading end to said trailing end.

5,181,831

VARIABLE CAPACITY WOBBLE PLATE COMPRESSOR

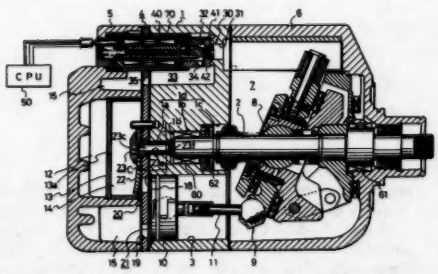
Takanori Teraya, Konan, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed May 18, 1992, Ser. No. 885,318

Claims priority, application Japan, May 22, 1991, 3-45937[U]

Int. Cl.[5] F04B *25/04*

U.S. Cl. 417—222 S **2 Claims**



1. In a variable capacity wobble plate compressor including a cylinder block, said cylinder block having a plurality of cylinders formed therein and a bearing-receiving hole formed therethrough, bearings received within said bearing-receiving hole, a discharging space defined on one side of said cylinder block, a crankcase defined on the other side of said cylinder block, a drive shaft having one end thereof supported by said bearings within said bearing-receiving hole, a wobble plate accommodated within said crankcase and mounted on said drive shaft, a plurality of outlet ports communicating between respective ones of said cylinders and said discharging space, discharge valve means having a plurality of valve elements for closing and opening respective ones of said outlet ports, a fixing member securing said discharge valve means to said cylinder block at said one side thereof, said fixing member having a head formed at an end thereof facing said discharging space, and a front end opposite to said head, and capacity control means for changing pressure within said crankcase to thereby change the capacity or delivery quantity of said compressor, wherein said fixing member has a high pressure-introducing passage formed therethrough for introducing high-pressure refrigerant gas within said discharging space to said bearing-receiving hole, and then into said crankcase,

the improvement wherein said high pressure-introducing passage comprises a bore formed therein and extending from said head to said front end, and a restriction bore formed through said front end, said restriction bore opening into said bearing-receiving hole.

5,181,832

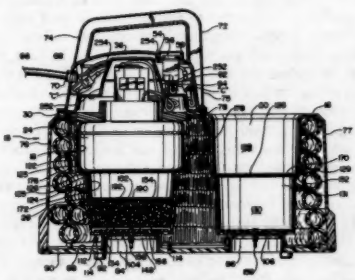
FAN MOTOR AND AIR HOSE STORAGE HOUSING FOR PORTABLE SPRAY PAINT GUNS

Terry R. Reents, Burnsville, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Jul. 30, 1991, Ser. No. 737,786

Int. Cl.[5] F04B *21/00, 34/04*

U.S. Cl. 417—234 **19 Claims**



1. An improved air flow structure for a portable painting apparatus comprising:

a) a fan motor assembly having an air outlet delivering air generally axially along an axis of the motor as the air exits the fan motor assembly;

b) a cover disposed over the air outlet of the fan motor assembly, the cover defining a generally rectangular air plenum having a pair of elongated side walls and a pair of short end walls at the air outlet, an arched top wall, and a circular air exit aperture in one of the end walls of the rectangular air plenum such that air exiting the fan motor assembly passes immediately into the air plenum and exits the plenum at substantially a right angle to the motor axis.

5,181,833

PORTABLE PUMP SYSTEM

Cindy S. Villa, and Johnny Villa, Jr., both of Andrews, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

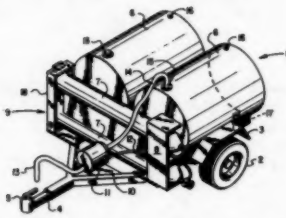
Filed Jun. 17, 1991, Ser. No. 716,451

Int. Cl.[5] F04B *21/00*

U.S. Cl. 417—234 **2 Claims**

1. In a vehicle for transporting a combined fluid pumping and storage system wherein a pump means carried by said vehicle is employed to pump fluid from a source external to

said vehicle into at least one storage means carried by said vehicle, the improvement comprising said pump means is a compressed gas operated diaphragm pump having inlet and outlet ports, said diaphragm pump means being driven by compressed gas so as to create a vacuum at said inlet port to pick up fluid from said external source and deliver said picked up fluid to said outlet port for further transport of said fluid to the interior of said storage means, at least two compressed gas supply means each having a compressed gas outlet end and carried by said vehicle in side-by-side relation with their compressed gas outlet ends adjacent to one another, first conduit means operably connecting said outlet end of said compressed gas supply means to said diaphragm pump means to operate said pump means, regulator means carried by at least one of said diaphragm pump means, said compressed gas supply means or said first conduit means for varying the pressure of the compressed gas employed to operate said diaphragm pump means, means for tightly but removably securing said compressed gas supply means to said vehicle at the end of said gas supply means which is opposite to said compressed gas outlet ends by way of an elongate locking member having opposing



first and second ends, said first end of said locking member being pivotally connected to and carried by said vehicle, said second end of said locking member being free swinging toward and away from said gas supply means, said locking member when in its locked position covering at least part of said end of said gas supply means which is opposite to said compressed gas outlet ends of said gas supply means, said locking member carrying at its second free swinging end a locking device for fixing said free swinging end of said locking member to said vehicle, and rotatable screw means threadably carried by said locking member for tightly engaging each of said gas supply means once said free swinging end of said locking member is fixed to said vehicle by way of said locking device, baffle means surrounding at least part of the front, top and bottom of said outlet ends of said compressed gas supply means to protect said outlet ends from impact by an outside source, second conduit means operably connected to said inlet port of said diaphragm pump means for picking up fluid from said external source, and third conduit means operably connecting said outlet port of said diaphragm pump means to the interior of said storage means.

5,181,834

SWASH PLATE TYPE COMPRESSOR

Hayato Ikeda; Toshiro Fujii; Naoya Yokomachi, and Shoji Takemoto, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokii Seisakusho, Kariya, Japan

Continuation-in-part of Ser. No. 880,574, May 8, 1992 and a continuation-in-part of Ser. No. 863,814, Apr. 6, 1992, which is a continuation-in-part of Ser. No. 884,721, May 18, 1992.

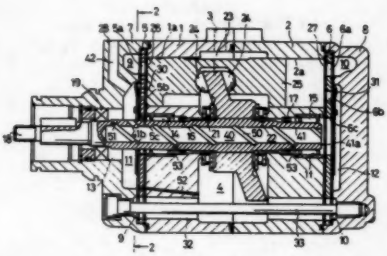
This application Jul. 21, 1992, Ser. No. 917,451

Claims priority, application Japan, Jul. 26, 1991, 3-187851

Int. Cl.[5] F04B *1/16*

U.S. Cl. 417—269 **5 Claims**

1. A compressor including a pair of cylinder blocks having a plurality of cylinders and a crank case leading to a suction port, a pair of housing sections having at least two discharge chambers, and covering both ends of the pair of cylinder blocks, a drive shaft being rotatably supported by the pair of cylinder blocks, a swash plate being mounted on the drive shaft and rotatably housed within the crank case, a plurality of pistons engaging the swash plate and moving within the cylinders in cooperation with the swash plate, wherein the refrigerant flows from the suction port into the cylinders via a suction passage, is compressed within each cylinder, is discharged into the discharge chambers via discharge ports, and is discharged out of the compressor via a final discharge port, the compressor comprising:



a discharge passage communicating with the discharge chambers, said discharge passage including a primary passage within the drive shaft; and

a groove formed on an inner wall of the primary passage for causing oil contained in the refrigerant to be separated therefrom.

5,181,835

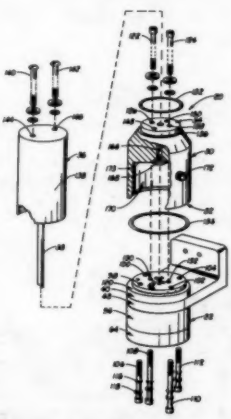
HYDRAULIC PUMP

Gregory D. Cook, Duncan, Okla., assignor to Cook Manufacturing Corporation, Duncan, Okla.

Filed May 15, 1991, Ser. No. 700,516

Int. Cl.[5] F04B *49/00, 37/00, 7/02*

U.S. Cl. 417—310 **7 Claims**



1. A hydraulic pump, comprising:

a pump body wherein are formed first and second ports for delivery of hydraulic fluid from one port and return of hydraulic fluid to the other port, first and second fluid distribution chambers, and first and second main valve passages, the first main valve passage fluidly communicating the first fluid distribution chamber with the first port and the second main valve passage fluidly communicating the second fluid distribution chamber with the second port;

pumping means in the pump body operable for drawing

hydraulic fluid from one fluid distribution chamber and discharging hydraulic fluid to the other fluid distribution chamber;

a first main pump valve disposed in the first main valve passage for movement to a sealing position wherein the first main pump valve seals the first main valve passage against fluid flow:

means for biasing the first main valve toward the sealing position thereof;

a second main pump valve disposed in the second main valve passage for movement to a sealing position wherein the first second pump valve seals the second main valve passage against fluid flow:

means for biasing the second main valve toward the sealing position thereof;

means fluidly communicated with the first fluid distribution chamber and responsive to fluid pressure therein for forcing the second main pump valve away from the sealing position thereof at such times that the pumping means is operated to draw hydraulic fluid from the second fluid distribution chamber and discharge hydraulic fluid into the first fluid distribution chamber; and

means fluidly communicated with the second fluid distribution chamber and responsive to fluid pressure therein for forcing the first main pump valve away from the sealing position thereof at such times that the pumping means is operated to draw hydraulic fluid from the first fluid distribution chamber and discharge hydraulic fluid into the second fluid distribution chamber.

5,181,836

BEVERAGE FANNING DEVICE

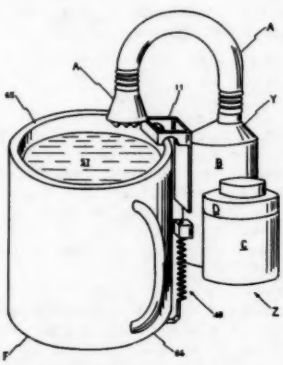
Eric S. Zeitlin, 3059 Grand Ave., Baldwin, N.Y. 11510

Continuation-in-part of Ser. No. 486,812, Mar. 1, 1990, Pat. No. 5,115,566. This application Jul. 8, 1991, Ser. No. 726,695

The portion of the term of this patent subsequent to May 26, 2009, has been disclaimed.

Int. Cl.[5] F04B *21/00*

U.S. Cl. 417—313 **10 Claims**



1. A combination cup and fan comprising:

a cup;

a fan means contained in a fan housing for providing a draft of air; and

attachment means securing said fan housing to a side of said cup.

5,181,837

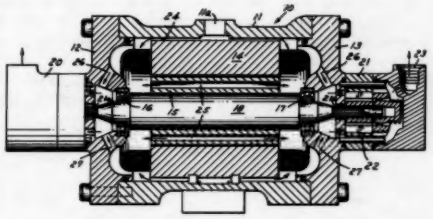
ELECTRIC MOTOR DRIVEN INLINE HYDRAULIC APPARATUS

Albin J. Niemiec, Sterling Heights, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Apr. 18, 1991, Ser. No. 687,173

Int. Cl.[5] F04B *35/04*

U.S. Cl. 417—350 **33 Claims**



1. An electric motor driven inline hydraulic apparatus comprising:

a housing having end plates closing said housing,

an electric motor stator mounted in said housing,

an electric motor rotor,

a shaft on which the rotor is mounted journalled in said housing,

a vane type pump mounted on one of the end plates,

said vane pump including a cam ring, a rotor and vanes on said rotor engaging said cam ring,

said vane pump having an inlet and an outlet,

said shaft extending through an opening in the end plate and being connected to the vane rotor of the vane pump,

said housing having an inlet through which hydraulic fluid is supplied to the interior of the housing and flows through passages in the housing to the intake of the vane pump on the end plate, such that the vane pump delivers fluid through an outlet on the end plate on which it is mounted, and

an programmable controller for controlling the speed of the electric motor, said pump comprising a variable speed pump, solenoid operated unloading valves operably by said controller for controlling flow from the pumps in sequence for meeting the velocity demands.

5,181,838

VEHICLE WASHER PUMP

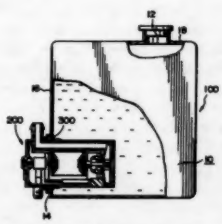
Toshihiro Sato, Toyohashi; Masaaki Kiyama; Yasuhiro Harita, both of Kosai, and Osamu Ozone, Toyohashi, all of Japan, assignors to Asmo Co., Ltd., Shizuoka, Japan

Filed May 28, 1991, Ser. No. 706,585

Claims priority, application Japan, Jun. 4, 1990, 2-59343[U]; Dec. 27, 1990, 2-414683

Int. Cl.[5] F04B *35/00*

U.S. Cl. 417—360 **16 Claims**



1. A vehicle window washing system, comprising: a tank for receiving a washing liquid and having inlet means; and a

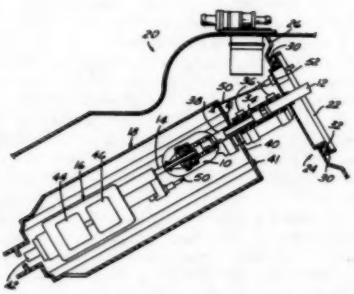
washer pump mounted in said tank, said tank further having an opening other than said inlet means formed therein at part of one of a lower side wall and a bottom wall thereof, and said washer pump comprises a cylindrical housing, a pump means disposed in said housing and including an inlet port and an impeller, with a motor means also disposed in said housing for rotatably driving said impeller, with outlet means formed in said housing to extend outwardly from an outer wall of said housing, and flow passage means connecting said outlet means with said pump means, whereby at least said pump means and said motor means are inserted into said tank through said opening in one of the lower side wall and the bottom wall and further comprising a watertight support means having elasticity for fixedly holding said washer pump relative to said tank such that said outlet means is positioned outside of said tank.

5,181,839

QUICK CONNECT FUEL PUMP ASSEMBLY

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed Jan. 9, 1992, Ser. No. 819,346
Int. Cl.[5] F04B *35/04*
U.S. Cl. 417—360 **9 Claims**



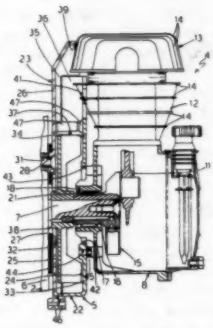
1. A quick connect assembly for connecting a fuel pump outlet line to a fuel supply line which comprises: a housing having a circumferentially continuous recess therein for receiving a grommet and a passage communicating with said recess and the exterior of said housing and constructed and arranged to receive a first line and communicate such first line with said recess, a grommet received in said recess, said grommet being of one piece of a flexible and resilient material and having a central portion with a through passage constructed and arranged to slidably receive a second line in sealing engagement therewith and to communicate such second line with said passage in said housing, a circumferentially continuous outer wall portion integral with and encircling said central portion and constructed and arranged for sealing engagement with said housing when received in said recess thereof, said recess for the grommet opens to the exterior of said housing, a cover overlying the opening of said recess and removably received on said housing, a clearance hole through said cover for passage of the second line into the grommet through said cover, and said grommet having an annular groove between said outer wall portion and said central portion constructed and arranged to communicate with said passage through said recess so that pressurized fuel in said assembly urges said outer wall portion of said grommet into sealing engagement with said housing and said central portion into sealing engagement with such second line when received therein.

5,181,840

ENGINE COMPRESSOR WITH A PERFECTED VENTILATING DEVICE

Franco Zecchini, via Anna Frank, Italy, assignor to Fini Electtrocostruzioni Meccaniche S.p.A., Fratelli Rosselli, Italy

Filed Feb. 13, 1991, Ser. No. 654,759
Claims priority, application Italy, Feb. 28, 1990, 4739 B/90
Int. Cl.[5] F04B *17/00*
U.S. Cl. 417—364 **9 Claims**



1. An engine compressor comprising:

an internal combustion engine having a drive shaft extending therefrom;

a compressor portion having a head and a cylinder inside of which a piston is located, the piston being attached to a connecting rod which is mechanically connected to said drive shaft so that the piston can be moved; and

a device for ventilating said head and said cylinder which includes a centrifugal impeller fitted on to said drive shaft located between the engine and the point at which said drive shaft is connected to said connecting rod, a housing installed between a casing of said engine and a casing of said compressor portion, said housing defining an internal ventilating chamber housing said impeller and having at least two holes defined therein so that said drive shaft can pass through the housing, an inlet formed in a central portion of said housing and through which ambient air is drawn into said chamber, and an outlet formed in a top portion of said housing and through which air is fed to said head and said cylinder.

5,181,841

SEWAGE PUMP

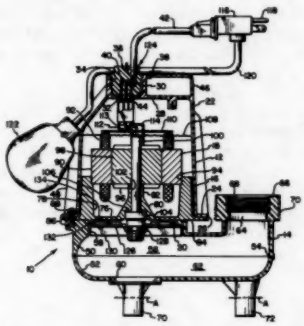
Dan R. Kirkland, Fort Wayne, Ind., assignor to Wayne/Scott Fetzer Company, Fort Wayne, Ind.

Division of Ser. No. 566,050, Aug. 10, 1990, Pat. No. 5,145,337.
This application Dec. 5, 1991, Ser. No. 803,144
Int. Cl.[5] F04B *35/04, 3/10*
U.S. Cl. 417—423.3 **3 Claims**

1. A method of resizing a volute for a sewage pump comprising the steps of:

a) providing a volute for a sewage pump having at least a portion that is molded as an integral piece including a bottom, an inlet aperture through said bottom, and a plurality of legs extending from said bottom, said inlet aperture having a diameter and said legs having a length wherein the length of said legs is related to the diameter of said inlet aperture such that a solid object that is small enough to pass beneath the bottom of said volute when said legs are resting on a flat surface can also pass through the diameter of said inlet aperture; and further including a sprue molded with said volute that partially occludes said

inlet aperture to restrict the size of solid object that can pass through said inlet aperture;



b) removing said sprue from said inlet aperture; and

c) leaving said legs at originally molded lengths.

5,181,842

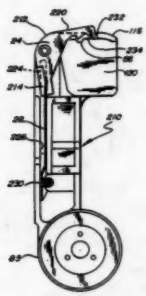
PERISTALTIC INFUSION DEVICE

Richard A. Sunderland, St. Charles; Clarence L. Walker, Webster Groves, and Mark A. Davis, O'Fallon, all of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 538,791, Jun. 15, 1990, Pat. No. 5,057,081. This application Mar. 1, 1991, Ser. No. 663,965

Int. Cl.[5] F04B *43/08*

U.S. Cl. 417—474 **20 Claims**



1. A fluid infusion device for delivering fluid to a patient comprising:

a housing assembly;

an infusion control means operatively associated with said housing assembly; and

a swing arm including an actuatable latch means associated therewith, said swing arm bring operatively mounted on said housing assembly and adapted to be rotatable about said infusion control means between an open position wherein a fluid delivery set may be operatively inserted thereon and a plurality of closed positions wherein said latch means is generally adjacent said housing assembly, said latch means being operatively movable between a first position wherein said latch means engages said housing assembly to retain said swing arm in one of said closed positions and another position of said latch means wherein said swing arm is releasable from said one of said closed positions.

5,181,843

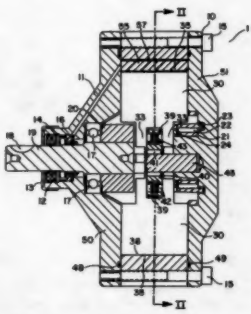
INTERNALLY CONSTRAINED VANE COMPRESSOR

Edward W. Hekman, Alto, and Frederick A. Hekman, Grand Rapids, both of Mich., assignors to Autocam Corporation, Kentwood, Mich.

Filed Jan. 14, 1992, Ser. No. 820,525

Int. Cl.[5] F04C *18/344, 27/00*

U.S. Cl. 418—1 **63 Claims**



1. An internally contraining vane rotary compressor comprising:

a stator having a hollow interior, circumferential interior wall, two end walls, and two openings through said circumferential interior wall defining an inlet to and an outlet from said stator interior;

a rotatable rotor having a hollow interior, said rotor eccentrically mounted within said stator such that the axis of rotation of said rotor is parallel to and offset from the axis of said stator;

a rotatable drive shaft passing through one of said end walls of said stator and projecting into said stator interior, said rotor affixed to said drive shaft for rotation therewith;

a fixed carrier shaft extending from one of said end walls towards said stator interior such that the cylindrical axis of said carrier shaft coincides with said axis of said stator;

a carrier ring residing within said rotor interior, said carrier being rotatably mounted on and rotatable about said carrier shaft; and

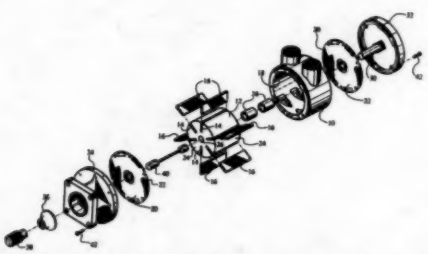
a plurality of vanes radially slideable within said rotor, said vanes being hingedly connected to said carrier, each of said vanes including a pair of tongues embracing either side of said carrier and means serving as a pin extending between said tongues and through an aperture in said carrier, there being an aperture in said carrier for each said vane and said vane pin means, whereby upon rotation of said rotor, said carrier constrains and guides said vanes such that their distal ends come close to, but do not engage the surface of said circumferential interior wall of said stator; at least one of said apertures being sufficiently small relative to its respective one of said pin means that rotation of said rotor and said vanes causes said carrier to rotate with said rotor, the engagement of said pin means and said at least one aperture also preventing radial outward movement of said vane; at least each of the remainder of said apertures comprising an arcuate passage with an arcuate interior wall positioned radially towards said carrier axis of rotation and an arcuate outer wall spaced outwardly therefrom, said interior and exterior arcuate walls being joined at their ends by arcuate passage end walls, the distance between said end walls being sufficiently short that said arcuate passages do not extend continuously from one passage to the next adjacent passage, and being sufficiently long to allow a degree of tangential motion in the arcuate passage, while said outer arcuate passage wall effectively prevents radial movement of the vane outward from the carrier center of rotation.

5,181,844

ROTARY VANE PUMP WITH CARBON/CARBON VANES

Jerry B. Bishop, Wichita, Kans.; Francis A. Schwind, and David B. Sawyer, both of Fort Worth, Tex., assignors to Sigma Tek, Inc., Augusta, Kans.

Filed Aug. 15, 1991, Ser. No. 745,498
Int. Cl.[5] F01C *21/02*
U.S. Cl. 418—152 **4 Claims**



1. An improved sliding vane rotary pump having a metallic liner and a cylindrical rotor, the rotor including a plurality of radial sliding vane slots, comprising:

at least one carbon/carbon sliding vane disposed in a slot to engage said liner for the pumping of a fluid through the rotary pump, the carbon/carbon vane comprising a plurality of layers laminated together from a non-metallic composite material of carbon or carbon graphite fibers held in a densified carbon matrix to form each layer.

5,181,845

ARRANGEMENT WITH PROTECTIVE EFFECTIVENESS AGAINST THE DEPOSITION OF LOW-MELTING GREASES OF HIGH VISCOSITY WHICH ARE CARRIED ALONG IN STEAM AT THE REMOVAL AND IGNITION OF HYDROGEN IN A GAS MIXTURE CONTAINING HYDROGEN, OXYGEN AND STEAM

Amiya K. Chakraborty, Erftstadt; Jurgen Rohde, Bergisch-Gladbach; Karl-Heinz Klatt; Helmut Wenzl, both of Julich, and Ralf Konrad, Sinn, all of Fed. Rep. of Germany, assignors to Forschungszentrum Julich GmbH, Julich and Gesellschaft fur Reaktorsicherheit, Cologne, both of, Fed. Rep. of Germany

Filed Jun. 28, 1991, Ser. No. 722,928
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1990, 4022132
Int. Cl.[5] F23D *3/40*
U.S. Cl. 431—7 **3 Claims**

1. A process for preventing the deposition of liquid grease or lubricant particles of high viscosity onto the surface of a catalytic igniter wherein said particles are carried along to the igniter with steam during the combustion of hydrogen from a gas mixture containing hydrogen, oxygen and steam, which comprises:

(a) enveloping a catalytic igniter with a protective means to shield said catalytic igniter until the initiation of ignition so as to protect the surface of the catalyst against contamination and against the depositing of grease or lubricant particles, said protective means comprising a thin filter material which is permeable to gas, substantially impermeable to grease and lubricant particles and convertible into light ashes during combustion initiated by said catalytic igniter, and

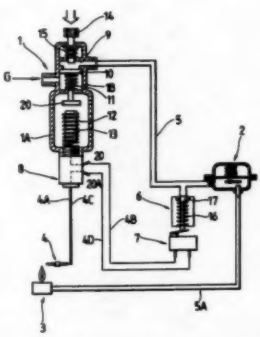
(b) igniting said catalytic igniter in the presence of a combustion gaseous mixture causing (i) said filter material to be converted into light ashes through combustion, (ii) any grease or lubricant particles present to be converted into soot through combustion and (iii) said light ashes and soot to be blown away from said igniter by the pressure differential resulting from the ignition of said combustible gaseous mixture.

5,181,846

SAFETY APPARATUS IN GAS HEATING DEVICE

Ui Y. Chang, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Aug. 14, 1991, Ser. No. 744,964
Claims priority, application Rep. of Korea, Aug. 16, 1990, 90-12620
Int. Cl.[5] F23N *5/10*
U.S. Cl. 431—80 **8 Claims**



1. A safety apparatus for controlling a gas burner, said safety apparatus comprising:

a safety valve for interrupting fuel gas to the gas burner;

a governor for maintaining constant gas pressure to the gas burner;

a thermocouple generating an electrical current in response to a flame emanating from the gas burner;

connecting means for providing an electrical coupling between a solenoid actuating said safety valve and said thermocouple; and

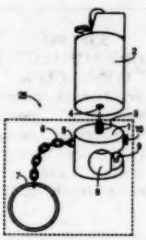
operation sensing means, for series connecting said thermocouple to the solenoid at the connecting means, for interrupting said electrical current from said thermocouple to said solenoid to thereby, shut off a flow of fuel gas through said safety valve in response to occurrence of particular operation conditions.

5,181,847

LIGHTER-KEY-HOLDER ARRANGEMENT

Edilberto A. Da Silva, 1542-Campos Eliseos, Ribeirao Preto-Sao Paulo, Brazil

Filed Nov. 20, 1991, Ser. No. 795,459
Claims priority, application Brazil, Aug. 12, 1991, 7101793[U]
Int. Cl.[5] F23Q 2/32
U.S. Cl. 431—253 4 Claims



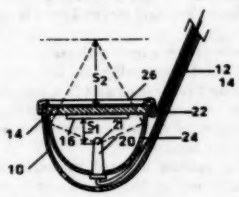
1. A lighter-key-holder arrangement, comprising:
a lighter having a threaded bore hole formed therein;
a key-holder comprising:
a detachable fitting having a threaded pin formed thereon to be received in said threaded bore hole formed in said lighter, and a transverse opening formed therein, said transverse opening being closed by a latch that is actuated by a spring and manually operated by an external button;
a connecting ring formed on said fitting;
a chain attached at one end to said connecting ring; and
a key-holder ring attached to an opposite end of said chain.

5,181,848

DENTAL MIRROR

Walter L. Griffith, 51 Cavalier Rd. East, Scottsville, N.Y. 14546

Filed Dec. 12, 1991, Ser. No. 805,972
Int. Cl.[5] A61B 1/24
U.S. Cl. 433—30 9 Claims



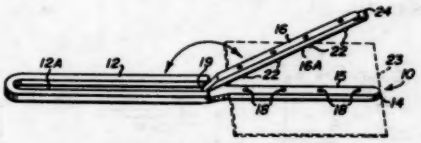
1. A dental mirror device, including:
an enclosure with a handle extending therefrom;
a cover on said enclosure, said cover including an outward reflective mirror and a transparent portion;
a light source disposed within said enclosure and adapted for connection through said handle to an energy source; and
a concave focusing reflector disposed within said enclosure relative to said light source to reflect light from said source through said transparent portion of said cover and to focus said reflected light in front of said mirror.

5,181,849

ARTICULATING PAPER HOLDER

Lars E. Calline, 110 Los Patios, Los Gatos, Calif. 95030

Filed Jan. 10, 1992, Ser. No. 819,489
Int. Cl.[5] A61C 3/00
U.S. Cl. 433—153 15 Claims



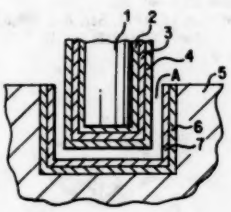
1. An articulating paper holder comprising:
an elongated handle;
an elongated holding arm securely attached to and extending from the handle;
a holding means for securely holding to the holding arm a piece of articulating paper for imprinting occlusal contact patterns, the elongated holding arm and the holding means being foldable onto and extendable from the elongated handle whereby the holding arm can be folded and protected by the handle when the holding arm is not in use.

5,181,850

MECHANICAL CONNECTING ELEMENTS

Stefan Neumeyer, Leminger Strasse 10, 8491 Eschlkam, Fed. Rep. of Germany

Continuation of Ser. No. 276,758, Nov. 28, 1988, abandoned. This application Dec. 12, 1991, Ser. No. 807,970
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740192; Mar. 30, 1988, 3810857
Int. Cl.[5] A61C 13/08, 5/08
U.S. Cl. 433—205 28 Claims



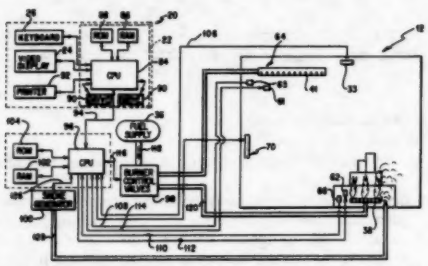
1. A supporting mechanical connecting system for use in the dental and medical fields, comprising:
a prefabricated connecting element made from a high-strength material, said connecting element coated with a substantially non-metallic, hydrolysis-stable bond-assisting layer; and
a non-deformable prefabricated receiving element for connecting to an organic or prosthetic portion of a living organism for providing a mechanical connection between said connecting element and the living organism, said receiving element made from a high-strength material, the non-metallic, hydrolysis-stable bond-assisting layer of said connecting element producing a hydrolysis-stable chemical or physical bond with said receiving element.

5,181,851

FLASHOVER SIMULATION FOR FIREFIGHTER TRAINING

Mark R. Layton, Severna Park; Ramon L. Palmer, Jr., Cockeysville, both of Md., and Lester L. Smith, Shrewsbury, Pa., assignors to AAI Corporation, Cockeysville, Md.

Filed May 22, 1991, Ser. No. 703,101
Int. Cl.[5] G09B *19/00*
U.S. Cl. 434—226 **26 Claims**



1. A flashover simulation system for use with a firefighter trainer, comprising:

a generally enclosed burn room having a main burner mounted therein;

at least one auxiliary burner positioned adjacent to a ceiling of the burn room, the auxiliary burner being selectively operable to burn fuel supplied thereto from a fuel reservoir;

a fuel ignitor positioned adjacent to the auxiliary burner; and

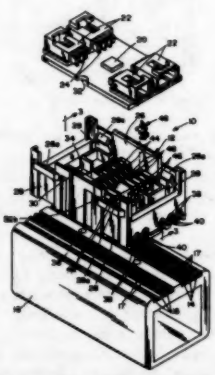
control means operable to effect fuel delivery to said auxiliary burner independently of fuel delivery to the main burner, wherein said control means comprises valve means associated with each of said main and auxiliary burners, said valve means being controllable independently of one another in accordance with signal input received from said control means.

5,181,852

PROGRAMMABLE INPUT-OUTPUT ELECTRICAL CONNECTOR

Philip J. Dambach, Naperville; Jerry A. Long, Elgin, and Stephen A. Sampson, Downers Grove, all of Ill., assignors to Molex Incorporated, Lisel, Ill.

Filed Dec. 16, 1991, Ser. No. 809,627
Int. Cl.[5] H01R *29/00*
U.S. Cl. 439—52 **14 Claims**



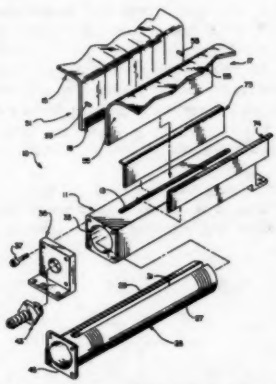
1. An electrical terminal for interposition between first and second opposing conductive surfaces, including an intermediate support portion and first and second spring contact portions projecting from the intermediate support portion for respectively engaging the first and second opposing conductive surfaces, wherein the improvement comprises complementary interengaging latch means between at least one of the first and second spring contact portions and the intermediate portion for holding the one spring contact portion out of engagement with the respective conductive surface.

5,181,853

FLUID PRESSURE ACTUATED ELECTRICAL CONNECTOR

Karl B. Van Brunt, Jr., Newark Valley, and James R. Petrozello, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 510,907, Apr. 18, 1990, Pat. No. 5,071,357. This application Mar. 7, 1991, Ser. No. 666,159
Int. Cl.[5] H01R *13/629*
U.S. Cl. 439—67 **17 Claims**



1. An electrical connector for providing electrical connection between an array of electrical contacts located on a first flexible circuit member and a first array of contacts located on a circuit board and between an array of contacts located on a second flexible circuit member and a second array of contacts located on said circuit board, said connector comprising:

a housing having first and second internal walls, said circuit board and said first and second flexible circuit members being positioned within said housing so that said arrays of electrical contacts on said circuit members are oriented in a facing manner and said circuit board is located therebetween;

first alignment means engaged with said circuit members and said circuit board for aligning said first and second flexible circuit members relative to said first and second arrays of contacts on said circuit board, respectively, before and during insertion of said circuit members and said circuit board into said housing;

an expandable bladder located substantially within said housing and including first and second portions in contact with said first and second internal walls of said housing, respectively, said first and second portions of said expandable bladder exerting force against said first and second flexible circuit members, respectively, to cause said circuit members to move toward said circuit board such that said arrays of electrical contacts thereon physically engage said arrays of contacts on said circuit board in a predetermined manner, said expandable bladder being sufficiently resilient during said engagement with said first and second flexible circuit members to substantially prevent lateral movement of said electrical contacts relative to said

contacts on said circuit board and thereby provide enhanced alignment of said contacts; and

fluid pressure means operatively coupled to said expandable bladder for expanding said bladder to effect said engagement between said first and second flexible circuit members and said circuit board.

5,181,854

PRESS-CONTACT TYPE ELECTRIC CONNECTOR FOR A FLAT, FLEXIBLE CABLE

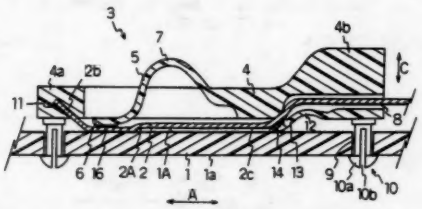
Katsuyoshi Masuda, Ayase, Japan, assignor to Molex Incorporated, Lisle, Ill.

Filed Mar. 30, 1992, Ser. No. 860,846

Claims priority, application Japan, Apr. 15, 1991, 3-33924[U]

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—67 **4 Claims**



1. An electric connector for connecting a flat, flexible cable to a printed circuit board comprising:

a housing having front and rear portions,

a slot in the housing front portion permitting insertion of a flat, flexible cable,

a resilient contact piece integrally connected therewith and adapted to push the conductor surface of said flat, flexible cable against and in registration with selected part of the circuit pattern on a printed circuit board,

characterized in that:

said housing having a groove formed in its rear portion to accommodate the leading edge of said flat, flexible cable when inserted in said housing, and having a flexible lock piece integrally connected to the housing in the vicinity of the cable slot, whereby said lock piece can push a side of said flat, flexible cable against the housing preventing the removal of the cable from the housing.

5,181,855

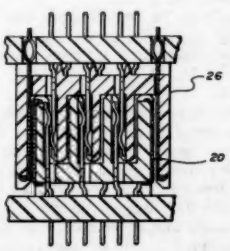
SIMPLIFIED CONTACT CONNECTOR SYSTEM

Rene A. Mosquera, Laguna Niguel, and Michael A. Lin, Anaheim, both of Calif., assignors to ITT Corporation, Secaucus, N.J.

Continuation of Ser. No. 771,276, Oct. 3, 1991, abandoned. This application Jun. 18, 1992, Ser. No. 899,581

Int. Cl.[5] H01R *13/00*

U.S. Cl. 439—74 **17 Claims**



1. A connector system which includes first and second matable connectors, wherein each connector has a housing with an open mating end for mating with the other connector by moving each connector in a corresponding mating direction toward the other connector until said connectors are fully mated, and wherein each connector has a plurality of rows of contacts with each contact including a forward end portion comprising an elongated beam of constant thickness, said beam having a straight rear part extending parallel to said mating direction and having a forward part that is bent to form a protuberance projecting sidewardly, with the extreme side of said protuberance forming a mating location which substantially engages the straight inner part of a corresponding mating contact when said connectors are fully mated, characterized by:

each said connector housing includes an insulator with a wall extending on a side of said beam opposite the direction of projection of said protuberance;

said rear part of each contact extends straight and parallel to said mating direction, said rear part is longer than said forward part, and said forward part has a free tip region which is positioned to engage said wall during mating.

5,181,856

CABLE PLUG FOR SPARK PLUGS

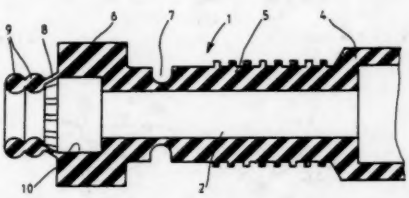
Paul Vente, Leverkusen, and Achim Wolfgarten, Köln, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 13, 1991, Ser. No. 807,301

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1991, 4101375

Int. Cl.[5] H01R *13/52*

U.S. Cl. 439—125 **2 Claims**



1. A cable plug for spark plugs, comprising a casing (1) made of non-conductive, flexible plastics material, in particular silicon, having a central duct (2) for accommodating an ignition cable (3), characterized in that at an entry side for the ignition cable (3), the casing (1) comprises at least one injection-molded seal ring (9) connected via a film (8) or webs with the casing (1) and an internal, coaxial, annular shoulder (10) for accommodating the seal ring (9), the internal diameter of the roller ring (9) being smaller than the thickness of the ignition cable (3) and the thickness of the roller ring (9) being dimensioned in such a manner that it makes contact with, and experiences a sealing deformation as it is pushed against the annular shoulder (10).

5,181,857

LATCH MECHANISM FOR A HEADER

Steven M. Layser, Lebanon, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 19, 1992, Ser. No. 854,383

Int. Cl.[5] H01R *13/62*

U.S. Cl. 439—157 **4 Claims**

1. Pivoting latch mechanisms on respective ends of multiple headers, comprising:

the ends of the multiple headers being located such that the latch mechanisms pivot against one another; and

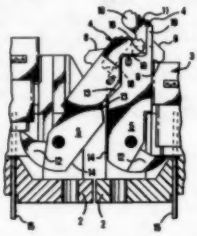
the latch mechanisms comprising;

lever members in first positions engaging respective electrical devices in the headers, the lever members each being

disengageable from the respective electrical devices by being pivoted fully to respective second positions,

actuation arms on respective lever members,

gripping surfaces on respective actuation arms to receive forces to pivot the respective lever members,



each of the lever members in said first position having a recess received against the other lever member with said other lever member being pivoted fully to said second position,

and with said other lever member being pivoted fully to the second position, the actuation arm thereon overlaps the actuation arm on said lever member in said first position.

5,181,858

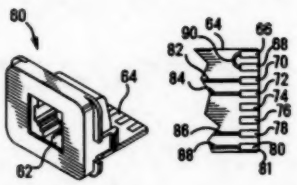
CABLE TYPE IDENTIFYING AND IMPEDANCE MATCHING ARRANGEMENT

Bret A. Matz, Harrisburg, Pa.; K. C. Babu, Kerala, and Hemant Kumar, K. R., Bangalore, both of India, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 30, 1991, Ser. No. 752,728

Int. Cl.[5] H01R *13/703*

U.S. Cl. 439—188 **4 Claims**



1. An arrangement for providing connections to a cable wherein the cable includes a first plurality of individual wires and the cable is classified as one of a distinct number of cable types, all of the cable types including the same predetermined first plurality of individual wires, with each of the cable types having a distinct electrical characteristic, the arrangement including:

a) cable termination structure including:

1) means for holding an end of a cable (**32**; **62**);

2) a second plurality of contact members arranged in a fixed position array, said second plurality of contact members including a first group (**40**, **42**, **48**, **50**; **70**, **72**, **78**, **80**) each corresponding to a respective one of said first plurality of individual wires and a second group (**36**, **38**, **44**, **46**; **66**, **68**, **74**, **76**);

3) means (**52**, **54**, **56**, **58**; **82**, **84**, **86**, **88**) for connecting the individual wires of a cable held by said holding means each to a respective contact member of said first group; and

4) identifying means (**90**) for providing a predetermined set of connections between the contact members of said second group, the predetermined set of connections being unique for a particular cable type; and

b) cable receiving structure including:

1) receptacle means (**100**) for receiving said contact members and providing electrical connections thereto;

2) means (**176**, **178**, **170**, **172**) for detecting the connections between said second group of contact members and providing an identification signal corresponding to the particular cable type attached to said cable termination structure; and

3) means (**174**, **138**) utilizing said identification signal for providing appropriate connections to said first group of contact members.

5,181,859

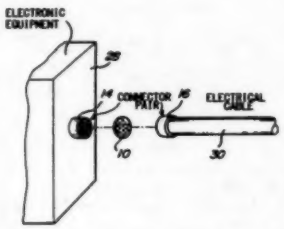
ELECTRICAL CONNECTOR CIRCUIT WAFER

Kevin G. Foreman, Sandia Park, and Paul J. Miller, Placitas, both of N. Mex., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 694,262, Apr. 29, 1991, abandoned. This application Jun. 5, 1992, Ser. No. 895,148

Int. Cl.[5] H01R *13/02*

U.S. Cl. 439—225 **34 Claims**



1. A device for making electrical connection to a plurality of pins in a male cable connector which mates with sockets in a female connector, the male and female connectors having outer shells which are removably connected together, said device comprising:

a wafer having a series of holes therein aligned with the pins in the male connector, the wafer having a diameter smaller than the diameter of the male connector shell, said wafer being insertable into the male cable connector shell so that the pins extend through the holes;

circuit means on the wafer for using electrical signals on the pins; and

contact means for making electrical contact between the pins as they extend through the holes in the wafer and the circuit means.

5,181,860

ELECTRICAL CONNECTOR WITH ROTATABLE LOCKING RING

Kazuhiro Honma; Kunio Watanabe; Takeshi Morita, and Shingo Nanno, all of Tokyo, Japan, assignors to Dalichi Denshi Kogyo Kabushiki Kaisha and Japan Aviation Electronics Industry Limited, Japan

Filed Mar. 26, 1991, Ser. No. 675,253

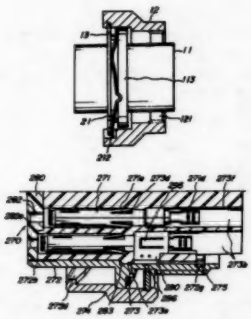
Claims priority, application Japan, Mar. 28, 1990, 2-79753; Jun. 18, 1990, 2-63556[U]; Jun. 18, 1990, 2-63557[U]

Int. Cl.[5] H01R *13/623*

U.S. Cl. 439—321 **2 Claims**

1. An electrical connector comprising, a plug connector and a receptacle connector for receiving the plug connector fitted therewith, said receptacle connector including a cylindrical receptacle shell provided on its outer circumference with fitting means extending circumferentially about a fitting axis, said plug connector including a cylindrical plug shell having a portion to be inserted into an inner aperture of said receptacle shell and a flange provided on an outer circumference of the plug shell, a cylindrical coupling ring surrounding the outer circumference of the plug shell and rotatable and holding said

flange of the plug shell on its forward and rearward sides, said coupling ring having on its inner circumference fitting means adapted to be fitted with said fitting means provided on the receptacle shell and a retainer ring located on the side of the flange opposite to said portion of the plug shell to be inserted into the receptacle shell, key means provided between the inner bore of said receptacle shell and the portion of the plug shell to be inserted into the inner aperture of said receptacle shell for preventing relative rotation between the plug and receptacle shells, at least one wave-shaped annular spring interposed between the flange and the retainer ring, said wave-shaped annular spring being rotatable together with the coupling ring, said wave-shaped annular spring and the flange being formed in their opposed surfaces with at least one protrusion and at least one recess, respectively, to form click lock means, the protrusion and the recess being oriented to be coincident in position with each other and detachably fitted with each other when said plug connector and said receptacle connector have been fitted, said plug connector and said receptacle connector being brought into coupling condition by rotation of said coupling, said electrical connector including a base insulator having at least one contact insert aperture and a contact inserted and anchored at the contact insert aperture, said contact being removable from the contact insert aperture of the base insulator by tool insertion from a connector fitting side, a cover insulator detachably secured to the base insulator on the connector fitting side and having a through-hole communication with said contact insert aperture of the base insulator and having a diameter smaller than that of the contact insert aperture, thereby enabling said through-hole to guide insertion of the contact, said cover insulator being provided with mounting protrusions for mounting the cover insulator on the base insulator, each of the mounting protrusions including a small diameter pin formed at its end with beveling and a larger diameter pin formed at the bottom of the mounting protrusion, thereby detachably securing the cover insulator to the forward surface of the base insulator by press-fitting the mounting protrusions into openings in the base insulator.



5,181,861

MANUALLY INSTALLABLE COAXIAL CABLE CONNECTOR

Joseph C. Gaver, Jr., Horseheads, and James C. Jorgenson, Montour Falls, both of N.Y., assignors to LRC Electronics, Inc., Horseheads, N.Y.

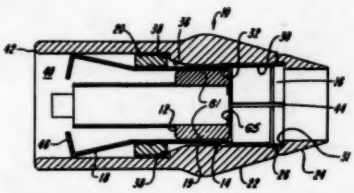
Continuation-in-part of Ser. No. 657,508, Feb. 19, 1991, Pat. No. 5,066,248. This application Sep. 5, 1991, Ser. No. 755,153
The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—578 **19 Claims**

1. A cable connector for mating a cable to an interface port, wherein said cable includes a conductor, an interior insulation, a shield and an insulating jacket and said interface port includes a conductive receptacle and an outer sheath, said cable connector comprising:

a housing having a cable insert end and an interface end;

a connector body dimensioned to fit substantially within said housing, said connector body comprising a collar end, a resilient fingered end and an intermediate portion therebetween;

a center post having a conforming portion with an outer dimension sized for conforming engagement with said intermediate portion of said connector body and a tubular portion dimensioned to receive said interior insulation and to electrically engage said shield of said cable; and



a locking member having an inner dimension to snugly, slidably engage said resilient fingered end of said connector body and an outer dimension slidably engagable with a portion of said housing,

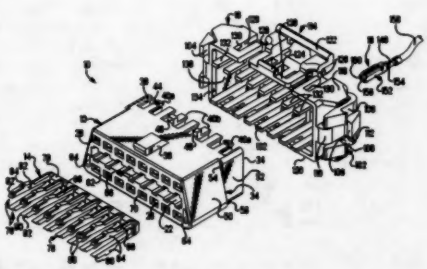
wherein said cable is manually installable within said connector by actuating said housing in a first direction such that said resilient fingered end engages said insulating jacket and said connector is manually installable on said interface port by actuating said housing in a second direction to facilitate frictional engagement of said collar end of said connector body and said outer sheath of said interface port.

5,181,862

DIAGNOSTIC HEADER ASSEMBLY

Gary W. Hawk, Halifax; Earl J. Hayes, Mechanicsburg; Alexander Hunt, III, Harrisburg, all of Pa., and Bobby G. Ward, King, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 29, 1991, Ser. No. 737,003
Int. Cl.[5] H01R *13/40*
U.S. Cl. 439—595 **7 Claims**



1. An electrical connector comprising:

a housing having a rear face and an oppositely facing front face, side surfaces extend from the front face to the rear face;

a plurality of terminal receiving cavities provided in the housing, the terminal receiving cavities extend from proximate the front surface to proximate the rear surface;

a plurality of terminals positioned in the terminal receiving cavities;

a latch receiving slot which extends from the front face

toward the rear face, the slot positioned proximate to the terminal receiving cavities;

a separate latch member positioned in the latch receiving slot, the latch member has a plurality of resilient latch arms provided thereon, the latch arms have free ends which are positioned proximate the front face of the housing, and fixed ends which are positioned away from the front surface toward the rear surface, the fixed ends are attached to a support portion,

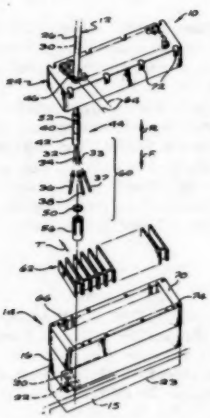
the free ends have bosses provided thereon, the bosses extend into the terminal receiving cavities to latch the terminals in respective terminal receiving cavities.

5,181,863

EMI SHIELDING BACKSHELL SYSTEM

David E. Welsh, Tustin, Calif., assignor to ITT Corporation, Secaucus, N.J.

Filed Apr. 29, 1991, Ser. No. 693,129
Int. Cl.[5] H01R *9/03*
U.S. Cl. 439—610 **13 Claims**



1. A system for terminating shielded cables wherein each cable has at least one wire with a prepared end and a shield around the wire, to a backshell housing which includes a conductive shell with front and rear ends and which may hold a connector insert having terminals for mating with the prepared ends of said wires, the housing also having a conductive cover that can mount over said shell rear end, said cover having a plurality of holes that each pass one of said cables, said cover having a front side facing said shell, characterized by:

a ferrule assembly which includes a ferrule that can slide forwardly through one of said cover holes and that is crimped around said cable to form a depressed crimped region having a forward end forming a shoulder, said ferrule having a rear end with a part that projects rearwardly into one of said cover holes;

said ferrule assembly including a conductive compressible seal which closely surrounds said ferrule rear end part and abuts said cover;

said ferrule assembly including a seal-compressing device which is supported against forward movement against said housing and which compresses said seal against said cover, to cause said seal to make good electrical contact with both said cover and said ferrule assembly;

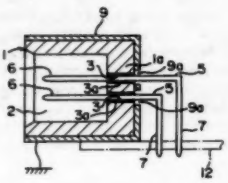
said device having a part that substantially abuts said shoulder at said forward end of said crimped region to help resist rearward movement of said ferrule.

5,181,864

CONNECTOR

Kikuo Wakino, and Iwao Fukutani, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Dec. 2, 1991, Ser. No. 801,510
Claims priority, application Japan, Dec. 3, 1990, 2-400241
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 **17 Claims**



1. A connector comprising:

a housing which is made of a varistor-characteristic resin material; and

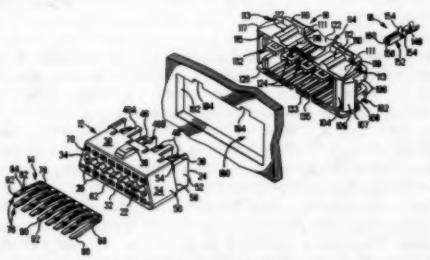
a signal coupling terminal conductor which penetrates a side wall of said housing.

5,181,865

ELECTRICAL CONNECTOR WITH SECONDARY LOCKING

Earl J. Hayes, Sr., Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 21, 1992, Ser. No. 839,976
Int. Cl.[5] H01R *13/514*
U.S. Cl. 439—752 **15 Claims**



1. An electrical connector assembly having a housing with terminal receiving cavities extending therethrough, terminals positioned in the terminal receiving cavities, a frame member which cooperates with the housing, the frame member is movable between an initial position in which the terminals are moved into the terminal receiving cavities and a final position in which the terminals are maintained in the terminal receiving cavities, the electrical connector assembly comprising:

the frame member has a plurality of sets of resilient fingers which extend therefrom, the resilient fingers have free ends, respective resilient fingers of each set having webs provided at the free ends thereof which extend between and connect the respective resilient fingers of each set to each other,

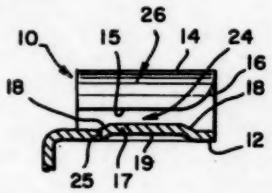
the housing has locking shoulders provided thereon, the locking shoulders are aligned with the webs, whereby the webs will cooperate with the locking shoulders to maintain the frame member in the initial position.

5,181,866

HIGH RETENTION LOW INSERTION FORCE ELECTRIC FEMALE DISCONNECT

Michael E. Jerome, Toms River, and Thomas A. Jerome, Barnegat, both of N.J., assignors to Heyco Stamped Products, Inc., Toms River, N.J.

Filed Apr. 3, 1991, Ser. No. 679,616
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—850 **21 Claims**



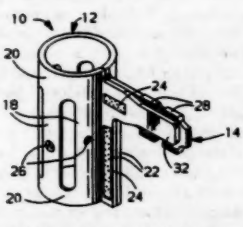
1. A high retention low insertion and withdrawal force electrical female disconnect stamped metal receptacle for engagement of a conductive metal tab comprising a generally channel section body, said body including a base, said base including opposite sidewalls, said base further including a floor, said opposite sidewalls rolled over, said rolled over sidewalls having edges, said edges of said rolled over sidewalls on a plane, said rolled over sidewalls and said edges forming stiffly resilient arms, said arms adjacent each other and overlying said floor, said floor having ends, said floor having a pad, said pad impressed inward of the level of said floor, said pad having a flat upper surface, said pad having side edges, said side edges adjacent said sidewalls, said side edges lanced from said floor, said pad having ends, said pad ends adjacent said floor ends, said pad including a slight spring resilience with regard to said floor, said tab including an insertion portion, said sidewall edges engagable with said tab insertion portion along their length, said edges spaced a distance from said pad slightly less than the thickness of said insertion portion of said tab, said arms with their edges being engagable to spring bias said insertion portion of said tab toward said pad, and said flat upper surface of said pad fully engagable with said insertion portion of said tab.

5,181,867

ELECTRICAL SLEEVE TERMINAL

Andrew F. Rodondi, Sharpsville, Pa.; Kenneth P. Cope, Leavittsburg; Joseph H. Gladd, Cortland, both of Ohio, and James R. Savich, Sao Jose Dos Campos, Brazil, assignors to General Motors Corporation, Detroit, Mich.

Filed May 8, 1992, Ser. No. 880,378
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—854 **11 Claims**



1. An electrical sleeve terminal of one piece construction having a sleeve for engaging a mating terminal and a crimp barrel for attaching the electrical sleeve terminal to an electric cable comprising:

the sleeve having a split and a plurality of equally circumferentially spaced longitudinal beams attached to upper and lower bands,

the sleeve further including elongated flanges at the respective longitudinal edges of the split that are securely fastened to each other,

each beam having a contact dimple that protrudes radially of the sleeve to biasingly engage a mating terminal at several points around its diameter when it is mated with the sleeve,

the contact dimples being staggered so that alternate dimples are located in longitudinally spaced planes to stabilize the interface between the sleeve and the mating terminal when it is mated with the sleeve,

the crimp barrel being an integral extension of one of the flanges and comprising conductor crimp wings and insulation crimp wings that are adapted for crimping around the conductor and insulation of an electric cable respectively, and

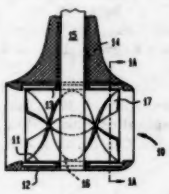
the terminal further including a separate finger that is an integral extension of the other of the flanges and that is fixed in the bottom of the crimp barrel so that it engages the conductor of an electric cable when the crimp barrel is crimped around the electric cable.

5,181,868

JET PROPULSION DEVICE FOR WATERCRAFT, AIRCRAFT, AND CIRCULATING PUMPS

Reinhard Gabriel, Illertalstr. 42 D-8963, Waltenhofen, Fed. Rep. of Germany

Filed Oct. 19, 1990, Ser. No. 600,411
Int. Cl.[5] B63H *11/00*
U.S. Cl. 440—38 **5 Claims**



1. A jet propulsion unit for propulsion of watercraft comprising

a jet propulsion pipe having an inner jacket and an outer jacket;

an enveloping pipe casing supporting the jet propulsion pipe;

a rotor formed by at least one screw, wherein said screw exhibits an outer edge and a through borehole;

an intake port and a discharge port;

where a fluid, flowing into the jet propulsion pipe is accelerated by the screw in a direction opposite to the intended thrust direction, and wherein a solid connection of the outer edge of the screw to the inner jacket of the jet propulsion pipe results in a joint rotation of said screw with said jet propulsion pipe, and wherein said jet propulsion pipe is driven at its outer jacket,

wherein an edge screw is formed by the screw with the through borehole, where part of the fluid entering into the jet propulsion pipe is not directly accelerated by said edge screw, and

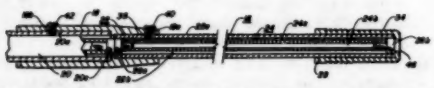
wherein said jet propulsion pipe protrudes on one side of said enveloping pipe casing, said jet propulsion pipe carrying one screw propeller attached to said jet propulsion pipe and rotating with said jet propulsion pipe and forming an additional drive element, said screw propeller having a diameter greater than the diameter of said jet propulsion pipe.

5,181,869

TILLER HANDLE EXTENSION

David F. Dantono, 24 Laurel Dr., Bridgewater, Mass. 02324, and Darrell F. LaTremouille, 72 Keith Pl., E. Bridgewater, Mass. 02333

Filed Mar. 9, 1992, Ser. No. 848,272
Int. Cl.[5] B63H *21/21*
U.S. Cl. 440—53 **1 Claim**



1. A tiller handle extension for controlling a marine type outboard motor having a tiller control handle with an adapter, said adapter being slidably mounted onto said tiller control handle, and secured thereto, said adapter and said tiller control handle having the same center line, comprising:

a tiller handle extension member having a body for positioning within said adapter in a central position relative to the center line of said adapter, and a longitudinal bore throughout said body;

an actuator having a body, a longitudinal bore throughout said body and buttons internally mounted in each end of said bore to permit said actuator to be slidably mounted and centralized within said bore of said tiller handle extension member; and

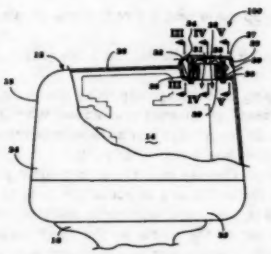
a retainer positioned at one end of said body of said tiller handle extension member for retaining said actuator within said bore of said tiller handle extension member.

5,181,870

COWLING AND AIR INLET DEVICE FOR OUTBOARD MOTOR

Hideto Arai, and Seiji Kobayashi, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 498,995, Mar. 26, 1990, abandoned. This application May 24, 1991, Ser. No. 707,272
Claims priority, application Japan, Mar. 25, 1989, 1-73176
Int. Cl.[5] B63H *21/24*
U.S. Cl. 440—77 **7 Claims**



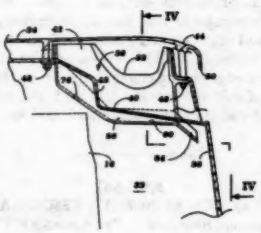
1. A cowling and air inlet device for the power head of an outboard motor having an internal combustion engine including an induction system, comprising a side wall surrounding the engine and a top cover covering the engine, air inlet means formed in said top cover, said top cover comprising a first part which covers a substantial portion of said internal combustion engine and a second part positioned lower than said first part to form a base of said air inlet means, air intake means formed within said air inlet means extending upwardly from said base to a position higher than the highest point of said first part of said top cover and having an opening at the top thereof higher than the highest point of said first part of said top cover for supplying air to said induction system, said air inlet means further comprising a cover adjoining and extending from said first part of said top cover for covering said air intake means, said air inlet means cover cooperating with said base to form an air inlet opening for inducting air from the atmosphere into said air inlet means for supply to said air intake means, said air inlet means cover having at least one air supply opening formed therein, a substantial portion of the top of said air inlet means cover being higher than said first part of said top cover so as not to lie in the same general plane as said first part of said top cover to define a flow path for air through said air inlet means to said air intake means.

5,181,871

SUCTIONED AIR INTRODUCING SYSTEM FOR THE OUTBOARD MOTOR

Noriyoshi Hiraoka, and Toyoshi Suzuki, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 10, 1991, Ser. No. 805,303
Claims priority, application Japan, Dec. 13, 1990, 2-419170
Int. Cl.[5] B63H *21/24*
U.S. Cl. 440—77 **16 Claims**



1. A cowling and air intake arrangement for a powerhead of an outboard motor having an internal combustion engine including an induction system, comprising: a main cowling portion fixed to a lower cowling tray; an engine cavity between said main cowling portion and said lower cowling tray; an air intake chamber formed in an upper, rearward portion of said main cowling portion; an air intake port opening to the atmosphere along a rearward portion of said air intake chamber; an air passage duct positioned laterally adjacent to said air intake chamber; wherein said air intake chamber and said air passage duct are provided with respective floors which substantially partition the bottom portions of said air intake chamber and said air passage duct from said engine cavity; and, also, wherein said air intake chamber and said air passage duct are provided with respective walls which extend upwardly from said floors; and further comprising a passageway communicating said air intake chamber and said air passage duct; and a gap located between an uppermost portion of said wall of said air passage duct and an inner, upper portion of said main cowling for allowing intake air flowing towards said engine induction system to pass from said air passage duct into said engine cavity.

5,181,872

EMERGENCY PROPULSION DEVICE

Kenneth Green, 411 Carlton St, Toronto, Ontario, Canada M5A 2M3

PCT No. PCT/GB89/00632, § 371 Date Dec. 4, 1990, § 102(e) Date Dec. 4, 1990, PCT Pub. No. WO89/12000, PCT Pub. Date Dec. 14, 1989

PCT Filed Jun. 7, 1989, Ser. No. 623,447

Claims priority, application United Kingdom, Jun. 8, 1988, 8813535

Int. Cl.[5] B63H *1/30*

U.S. Cl. 440—101 **11 Claims**

1. Auxiliary propulsion device for a boat, wherein:

the device includes a collapsible scoop, and a shaft-handle;

the arrangement is such that a person in the boat may apply a thrust-force through the handle to the scoop, in direction to the rear of the boat, the reaction to said thrust-force being effective to propel the boat forwards;

the scoop comprises a top panel, a bottom panel, and at least one connecting panel;

the top and bottom panels have front and rear edges;

the scoop includes a main hinge, upon which the top and bottom panels are hinged, and which is operatively connected between the rear edges of the top and bottom panels;

the scoop is capable of adopting two conditions, a wide open condition and a collapsed condition;

in the wide open condition, the top and bottom panels are pivoted apart about the main hinge, and in the collapsed condition the top and bottom panels are pivoted together about the main hinge;

in the wide open condition, the top and bottom panels present a comparatively large rearward-facing area to the water, said area being in the plane lying transverse to the direction of thrust;

in the collapsed condition, the top and bottom panels present a comparatively much smaller area to the water in said transverse plane;

the arrangement of the scoop is such that the scoop collapses to the closed condition upon being drawn through the water in the opposite direction to the direction of thrust;

the arrangement of the scoop is such that the at-least-one connecting panel, at least in the wide open condition, lies substantially edge-on to the direction of thrust, whereby the connecting panel acts as a rudder to prevent the scoop deviating from the direction of thrust;

the at-least-one connecting panel comprises an upper and a lower portion;

the upper portion of the connecting panel is hinged to the top panel about an upper hinge;

the lower portion of the connecting panel is hinged to the bottom panel about a lower hinge;

the two portions of the connecting panel are hinged together about a side hinge;

the top panel, the bottom panel, and the upper and lower portions of the connecting panel, are all of a substantially stiff, non-flexible, plastic sheet material;

all the said hinges are living hinges, being hinges of the kind formed by locally thinning the sheet material;

one of either the top panel or the bottom panel is provided with a coupling means for coupling the shaft-handle to that one panel;

the said coupling means is so arranged that, in operation of the device, the shaft-handle and that one panel are coupled together in such a manner that the shaft-handle can undergo substantially no pivoting or any other movement relative to that one panel during the said relative pivoting movement of the two panels, from the wide open condition to the collapsed condition of the scoop.

5,181,873

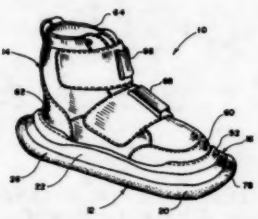
WATER SPORT FOOTWARE

James H. Tolbert, 106 Winfield Cir., Newport News, Va. 23601

Continuation-in-part of Ser. No. 324,732, Mar. 17, 1989, Pat. No. 5,078,633, which is a continuation-in-part of Ser. No. 784,577, Oct. 4, 1985, abandoned. This application Oct. 7, 1991, Ser. No. 772,065

Int. Cl.[5] B63B *35/81*

U.S. Cl. 441—65 **9 Claims**



1. A water sport footwear, comprising:

an upper shoe portion for accommodating a foot of a wearer;

a sole assembly secured to the shoe portion along entire length of the shoe portion, the sole assembly further comprising:

a solid upper rigid plate having a top surface;

a lower flexible impact absorbing plate fixedly attached to the upper rigid plate, said lower plate having a top surface which is provided with a recess, the recess being sized and shaped to receive the upper plate therein; and

a continuous integral shoe portion mounting wall extending upwardly from the upper rigid plate and defining an area within which the shoe portion is secured, the mounting wall being integrally formed with the upper plate, and wherein a continuous outwardly extending border is formed between outer peripheral edges of the upper plate and outer peripheral edges of the mounting wall, said border being formed, at least in part, by the top surface of the upper plate.

5,181,874

METHOD OF MAKING MICROELECTRONIC FIELD EMISSION DEVICE WITH AIR BRIDGE ANODE

Marko Sokolich, Los Angeles, and Zaher Bardai, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 675,590, Mar. 26, 1991, Pat. No. 5,136,205. This application Apr. 8, 1992, Ser. No. 865,384

Int. Cl.[5] H01J *9/14*

U.S. Cl. 445—24 **1 Claim**

1. A method of making a field emission device, the field emission device comprising a substrate, an array of field emission tips on the substrate and a plurality of rows of conductive air bridges spanning the array of field emission tips, wherein the air bridges are formed by the process comprising the steps of:

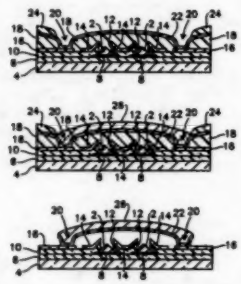
depositing a first layer of photoresist over the substrate covering the field emission tips;

forming openings in the first layer, the openings having the shape and spacing of the air bridges;

forming a metallic membrane over the openings to form a plating base for the air bridges;

forming a second layer of photoresist over the substrate covering the metallic membrane and exposed portions of the first layer;

forming second openings in the second layer, the second openings having the shape and spacing of the air bridges and exposing portions of the metallic membrane;



forming a metal layer over the second openings; and

removing the remaining portions of the first and second layers.

5,181,875

BUBBLE-FORMING TOY SWORD

Gary K. Hasegawa, 1457 W. Hutchinson, Chicago, Ill. 60613

Filed Mar. 9, 1992, Ser. No. 848,029

Int. Cl.[5] A63H *33/28, 3/00, 33/30*

U.S. Cl. 446—15 **11 Claims**

1. A bubble-making device comprising a sword-shaped member including a flat blade portion having a peripheral rib, a proximal unreinforced trough section, and a distal holed section with a plurality of bubble forming holes therethrough, said blade portion being transversely flexible and by means of said trough section being unreinforced adapted to vibrate to facilitate release of bubble-forming film applied to the blade-shaped member being swished about transverse to said blade portion.

5,181,876

FLYING DISK AND TOP

Ching-Ming Chen, No. 8, Lane 14, Sec. 2, Tung-Kuang Rd., and Cheng-Fu Lee, No. 58, Alley 61, Sec. 1, Ta-Cheng Rd., both of Tainan City, Taiwan

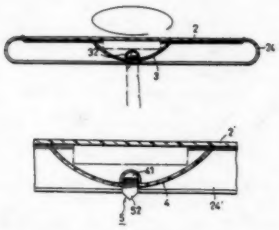
Filed Mar. 3, 1992, Ser. No. 845,235

Int. Cl.[5] A63H *27/00, 1/00*

U.S. Cl. 446—47 **1 Claim**

1. A flying disk including a circular plastic plate having an upper surface, a lower surface and an annular flange extending downward therefrom to a plane parallel to said circular plate, a circuit board being provided on said lower surface of said circular plate, a plurality of illuminating units being provided on said upper surface of said circular plate, and electrically connected to said circuit board, and a bowl-shaped member being attached to said lower surface of said circular plate, encapsulating said circuit board;

the improvement comprising: said bowl-shaped member having a vertical height with respect to said circular plate which is less than a vertical height of said annular flange with respect to said circular plate, said bowl-shaped member having a lower portion with a threaded recess which extends into said bowl-shaped member;



a short rod having a tapered end and another end of said short rod being threadable into said threaded recess, said rod having a length allowing said tapered end to extend below said plane when said short rod is threaded into said threaded recess; and

whereby said short rod can be removed from said threaded recess, and a finger can be inserted into said threaded recess to balance said circular plate while said circular plate is rotated.

5,181,877

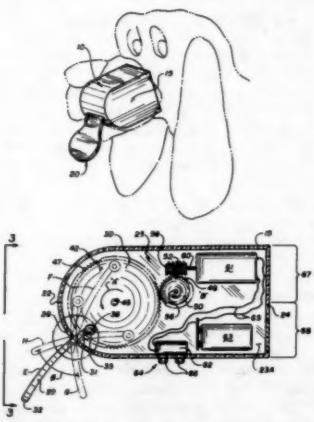
APPARATUS FOR SIMULATING A LICKING MOTION

Jerzy Perkitny, Bay Village, Ohio 44140, assignor to Those Characters From Cleveland, Cleveland, Ohio

Filed May 16, 1991, Ser. No. 701,205

Int. Cl.[5] A63H *3/36*

U.S. Cl. 446—337 **13 Claims**



1. An apparatus for simulating the licking motion of a tongue comprising:

a housing having a wall with an opening formed therein,

a rotatable member disposed within the housing,

means for rotating the rotatable member in a single direction,

a tongue-shaped member pivotally connected at a pivot axis toward the periphery of said rotatable member and extending partially through the opening in the wall,

the rotatable member moving said tongue-shaped member relative to the opening in the wall as said rotatable member rotates,

said tongue-shaped member adapted to engage an edge of the opening in the wall as the rotatable member rotates to cause predetermined pivotal movement of said tongue-shaped member and predetermined movement of said tongue-shaped member relative to the opening in the wall to simulate a licking motion such that at one point during the rotation of said rotatable member, the pivot axis is substantially vertically aligned with respect to the opening in said wall, while at another point during the rotation of said rotatable member, the pivot axis is substantially horizontally aligned with respect to the opening in said wall.

5,181,878

DEVICE FOR CUTTING LOOSE THE RECTUM OF A SLAUGHTERED ANIMAL CARCASS

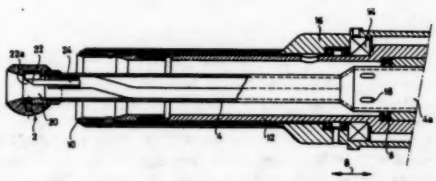
Marinus F. L. Bekkers, Son en Breugel, Netherlands, assignor to C.C.M. Beheer B.V., AD Nuenen, Netherlands

Filed May 20, 1991, Ser. No. 702,038

Claims priority, application Netherlands, May 17, 1990, 9001152

Int. Cl.[5] A22C *21/06*

U.S. Cl. 452—109 **8 Claims**



1. Device for cutting loose the rectum of the carcass of a slaughtered animal, having a shut-off and positioning element to be introduced into the anus, which element is fitted at the end of an elongated carrier and has concentrically around it a rotary cutting element, and having means for creating a vacuum around said carrier, the shut off and positioning element being provided with a bore open at its front side, and a flushing liquid supply channel opening out into this bore.

5,181,879

METHOD AND APPARATUS FOR PROCESSING FISH INTO TRANSVERSE SECTIONS

James M. Lapeyre, deceased, New Orleans by Noreen B. Lapeyre, Administratrix ; Christopher Greve, Covington, and Ronald M. O'Connor, Jefferson, all of La., assignors to The Laitram Corporation, Harahan, La.

Filed Jan. 22, 1992, Ser. No. 824,006

Int. Cl.[5] H22C *25/18*

U.S. Cl. 452—160 **22 Claims**

1. An apparatus for processing a frozen elongated fish body, with a longitudinal axis extending from the fish head to tail, into a plurality of transverse fish body sections comprising:

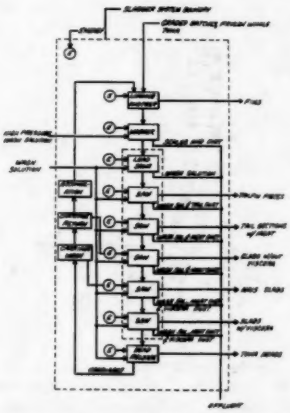
a) support frame defining a work station;

b) holding means for supporting a fish body to be processed with respect to the work station;

c) cutting means positioned adjacent the frame for making a transverse cut through the fish body to be processed;

d) the work station having moving means for transporting the holding means and cutting means with respect to each other between first and second positions and along a travel path which traverses the fish body across the cutting means so that a transverse cut can be made at a desired position on the fish body with the cutting means; and

e) means for sequentially positioning the fish body and the cutting means with respect to each other to form a desired



number of sequential cuts of the fish body, so that multiple and sequential transverse cuts of substantially equal spacing can be made at various positions along the same fish body being processed to produce transverse fish body sections of substantially uniform thickness.

5,181,880

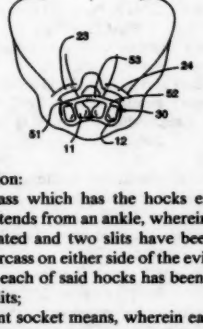
METHOD AND APPARATUS FOR TRUSSING POULTRY

Henry J. Volk, 1863 Anning, Turlock, Calif. 95380

Continuation-in-part of Ser. No. 723,444, Jun. 27, 1991, Pat. No. 5,102,370. This application Jan. 21, 1992, Ser. No. 822,647

Int. Cl.[5] A22C *21/00*

U.S. Cl. 452—174 **2 Claims**



1. In combination:

a poultry carcass which has the hocks exposed, wherein each hock extends from an ankle, wherein said carcass has been eviscerated and two slits have been formed in the skin of the carcass on either side of the evisceration cavity, and wherein each of said hocks has been pushed through one of said slits;

a pair of resilient socket means, wherein each socket means is expanded to pass over an exposed hock and then contracts to grasp an ankle, and

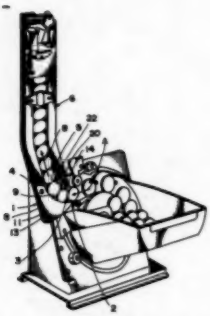
connecting means for joining said pair of resilient socket means.

5,181,881

OUTLET DEVICE FOR COIN PAYOUT HOPPERS

Hiroshi Abe, Tokyo, Japan, assignor to Asahi Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1991, Ser. No. 789,963
Claims priority, application Japan, Nov. 15, 1990, 2-307192
Int. Cl.[5] G07D *1/00*
U.S. Cl. 453—57 **5 Claims**



1. An outlet device for a coin payout hopper including an outlet chute comprising a curved outlet chute passage having a lower inlet through which coins are pushed into the passage substantially in the horizontal direction and an upper outlet through which coins are pushed out the passage substantially in the vertical direction, an outside edge plate having an outside coin guide track positioned at the outside with respect to the center of the radius of curvature of the curved outlet chute passage and being fixed to a coin supporting back plate such that the outside coin guide track is inclined at an angle to the surface of the coin supporting back plate, an inside edge plate having an inside coin guide track positioned at the inside with respect to the center of the radius of curvature of the curved outlet chute passage and being covered at the lower inlet portion thereof with a flexible front plate such that a portion of the flexible front plate is extended beyond the inside coin guide track to engage outer peripheral portions of coins, at least one rotatable tapered guide roller having an inverted conical surface arranged at the upper outlet portion adjacent to the inside edge plate, and means for urging the tapered roller to engage the inverted conical surface with the outer periphery of the coin, thereby urging the coin to the surface of the coin supporting back plate.

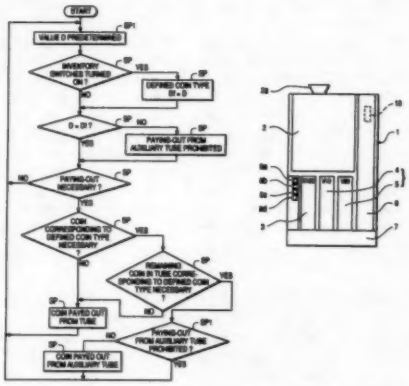
5,181,882

COIN RETURN CONTROL SYSTEM FOR VENDING MACHINES

Tadashi Miyazawa, Tatebayshi, Japan, assignor to Sanden Corporation, Gunma, Japan

Continuation-in-part of Ser. No. 430,171, Nov. 1, 1989, Pat. No. 5,024,313. This application May 9, 1990, Ser. No. 520,825
Claims priority, application Japan, May 9, 1989, 1-52612[U]
Int. Cl.[5] G07D *1/02*
U.S. Cl. 453—63 **4 Claims**

4. A coin control system for vending machines comprising:
an auxiliary change retaining tube;
an inventory switch for forcing a distribution of change from the auxiliary change retaining tube when the inventory switch is actuated;
a coin denomination predetermination switch having a switch position for predetermining a particular coin denomination for coins retained in the auxiliary change retaining tube; and
a control unit having a memory for retaining a particular coin denomination for the auxiliary change retaining tube predetermined by the position of the coin denomination predetermination switch when the inventory switch is actuated;
wherein the control unit prohibits distribution of change from the auxiliary change retaining tube when the particular coin denomination retained in the memory does not equal the particular coin denomination predetermined by the switch position of the coin denomination predetermination switch.

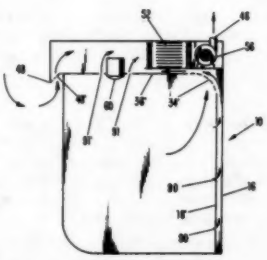


5,181,883

SMOKER'S BOOTH

Joseph S. Hofstra, Los Lunas; Ronald J. Karaskiewicz, and Mark R. Fischer, both of Albuquerque, all of N. Mex., assignors to Quality Air Systems, Inc., Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 525,327, May 17, 1990, Pat. No. 5,085,134. This application Nov. 8, 1991, Ser. No. 790,654
The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.
Int. Cl.[5] F24F *7/007;* **B08B** *15/02*
U.S. Cl. 454—49 **36 Claims**



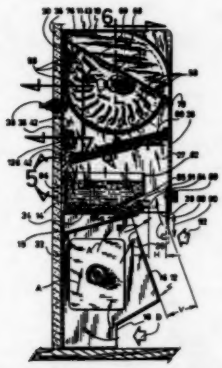
1. A smoker's booth for receiving and accommodating one or more smokers and for isolating smokers and tobacco smoke, said smoker's booth comprising:
ducted walled enclosure means;
ceiling means;
smoker's access means disposed in said walled enclosure means for providing ingress and egress for the smokers; and
means for venting tobacco smoke from said walled enclosure means and away from the vicinity proximate to said walled enclosure means.

5,181,884

VENTILATING DEVICE FOR BASEBOARD HEATER

Jean-Louis Ducharme, 671 Cadillac Street, Montreal, Canada H1N 2T2

Filed Dec. 11, 1991, Ser. No. 804,923
Int. Cl.[5] F24F 7/007
U.S. Cl. 454—246 5 Claims



1. A self-contained ventilating device for a baseboard heater having a back panel, a front panel, a substantially flat, horizontal, top panel and a rectilinear heated air exit along said front panel, adjacent to said top panel, said back panel fixed flat against a room wall, said device comprising an elongated housing having a back wall, a front wall, a top wall, end walls and opened at the bottom, means to fix said housing in an operative position with said back wall flat against said room wall and the bottom edges of said end walls sitting on said top panel, the distance between said back and front wall of said housing being greater than the distance between said back and front panels of said heater so that said front wall is located forwardly of said heated air exit when said device is in said operative position, said housing defining a marginal rectilinear slot along and behind said front wall, said front wall having a lower edge portion extending below said bottom edges of said end walls and therefore below said top panel of said heater in the operative position of said housing, said marginal slot receiving the heated air exiting from the front of said baseboard heater and said lower edge of said front wall preventing entrance of non-heated room air into said marginal slot in the operative position of said housing, said housing being provided with air exit apertures made in said top and front walls, a rotatable fan mounted in said housing for sucking air from said marginal slot and projecting it through said apertures, said blower fan including an electric motor, an axle drivingly connected to said electric motor and extending parallel to said top wall below the same and a plurality of spaced ventilating drums carried by said axle.

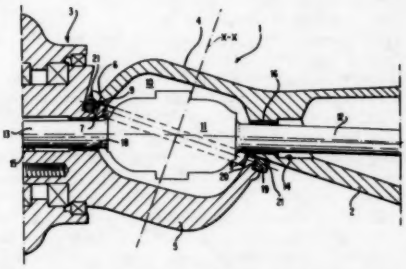
5,181,885

JOINT STRUCTURE FOR CONNECTING A DRIVING STEERABLE WHEEL HUB TO AN AXLE, PARTICULARLY FOR AGRICULTURAL TRACTORS

Armando A. Fabris, Campodarsego, Italy, assignor to Carraro SpA, Campodarsego, Italy

Filed Feb. 11, 1991, Ser. No. 653,532
Claims priority, application Italy, May 11, 1990, 41595 A/90
Int. Cl.[5] F16D 3/84
U.S. Cl. 464—170 6 Claims

1. A structure interlinking an axle (2) with a hub (3) of a steering drive wheel, particularly for use with agricultural machines, which comprises two cup-shaped bodies (4,5) being respectively unitary with the axle and the hub and face coupled together in a relationship of relative rotation about a steering axis of the wheel, said cup-shaped bodies defining, on the interior thereof, a sealed cavity (10) through which a driving means extends wherein the face coupling for said cup-shaped



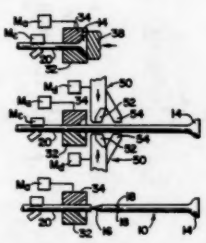
bodies is provided by helical threadways (19,20) carried on said bodies and having a threadway axis (X—X) coincident with the steering axis of the wheel.

5,181,886

METHOD AND APPARATUS FOR MAKING A FORMING PIN

Don T. Van Allman, Palatine, Ill., and Amos Corbin, Cynthiana, Ky., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Mar. 13, 1992, Ser. No. 851,065
Int. Cl.[5] B21G 3/00
U.S. Cl. 470—40 12 Claims



1. A method for making a forming pin having a groove so as to enable a protruding portion of the forming pin, when driven into a workpiece, to be severed at the groove, comprising the steps of:

(a) gripping an elongate wire firmly at a position wherein an end of the wire is exposed;

(b) forming a head at the exposed end of the wire while said wire is gripped;

(c) axially advancing the wire by a predetermined axial distance; and

(d) simultaneously (1) forming a point on the advanced wire and (2) forming a groove upon the advanced wire for reducing the cross-section of the advanced wire.

5,181,887

AUTOMATICALLY REGULATED BELT STRETCHING DEVICE

Pietro Pattano, Villa Cortese, Italy, assignor to Fiat Auto S.P.A., Turin, Italy

Filed Oct. 23, 1991, Ser. No. 781,381
Claims priority, application Italy, Oct. 24, 1990, 21857 A/90
Int. Cl.[5] F16H 7/12
U.S. Cl. 474—101 9 Claims

1. An engine temperature-regulated belt tensioner for an engine which, in normal expected use, heats up to an operating temperature from a lower ambient temperature during an

initial period of operation, and which engine is associated with a driven endless belt that is entrained about a plurality of pulleys so as to advance along a path which includes a path segment between two such pulleys, within which path segment the belt is located adjacent the engine,

said belt tensioner comprising:

a heat-conductive support arranged to be fixed to the engine beside said path segment;

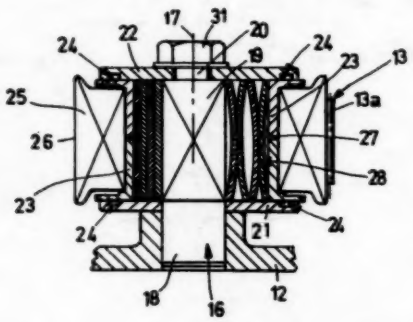
a heat-conductive pin mounted on said support so as to have a longitudinal axis thereof extending transversally of said path and parallel to axes of rotation of said two pulleys;

a first nonrotary, annular end flange provided about said pin adjacent said support, for defining a substantially stationary, radially extending, axially facing first shoulder on said pin;

a second nonrotary, annular end flange provided about said pin more distally of said support than said first end flange, said second end flange being axially spaced along said longitudinal axis of said pin from said first end flange and defining a substantially stationary, radially extending, axially facing second shoulder on said pin;

said first and second shoulders being disposed to confront one another with axially spacing between them along said longitudinal axis;

an annular bushing means radially spacedly encircling said pin between said first and second shoulders and being effectively supported on axially opposite ends thereof by said shoulders for limited lateral shifting transversally of said longitudinal axis;



annular bearing means including a first annular portion engagingly supported by said annular bushing means for limited lateral shifting movement therewith and a second annular portion which is rotatably supported on said first annular portion for lateral shifting movement therewith and for rotation about an axis which is substantially parallel to or concident with said longitudinal axis, said second annular portion having a radially outer, radially outwardly presented surface arranged to be disposed along a segment thereof in belt-tensioning rolling engagement with said driven endless belt within said path segment; and

thermally responsive resilient means housed axially between said shoulders in two diametrically opposed sets each such set being engaged between said pin and said bushing means, and arranged to thermally dependently laterally shiftably support said bushing means relative to said pin for limited lateral movement along an axis which is transverse to said longitudinal axis and transverse to said path segment, for varying deflection of said belt in said path segment in proportion to variation in temperature of said engine between said ambient temperature and said operating temperature.

5,181,888

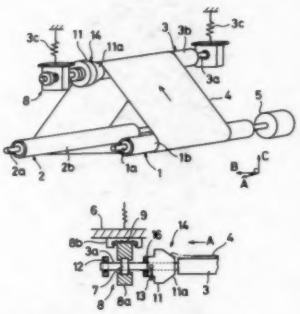
BELT DRIVING SYSTEM

Mitsuhiko Takahashi; Hirofumi Miyata; Shinya Yuki; Keizo Nonaka; Yoshihisa Nakano; Hiroshi Mitsuhashi; Katsuya Yamaguchi, and Yasuhiko Yoshida, all of Kobe, Japan, assignors to Bando Chemical Industries, Inc., Kobe, Japan

Filed May 24, 1991, Ser. No. 705,421

Int. Cl.[5] F16H *7/22*

U.S. Cl. 474—101 **14 Claims**



1. A belt driving system comprising:

a flat belt;

a plurality of rollers, said flat belt being wound round said rollers, at least one of said rollers being a drive roller, and at least one of said rollers being a creep adjusting roller for adjusting creep of said belt;

creep detecting means, supported by an end of said creep adjusting roller, rotatable independently from said creep adjusting roller;

biasing means for biasing said flat belt toward said creep detecting means; and

roller-end displacing means, connected to said creep detecting means, for converting torque received by said creep detecting means when said flat belt is in contact with said creep detecting means to a movement for displacing said end of said creep adjusting roller in a predetermined direction so that said flat belt is moved in direction contrary to creep caused by said biasing means;

said roller-end displacing means comprising a woundable member having one end thereof connected to said creep detecting means for winding said woundable member and another end connected to a fixed member.

5,181,889

TENSIONER FOR A TOOTHED BELT

Masao Maruyama; Nobuto Kozakura, and Katsuya Nakakubo, all of Saitama, Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed May 30, 1991, Ser. No. 707,867

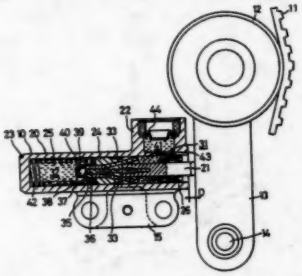
Claims priority, application Japan, May 31, 1990, 2-56556[U]

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—110 **5 Claims**

1. A tensioner for a toothed belt comprising: a cylinder; a piston arranged to slide within said cylinder and dividing said cylinder into a front chamber and a rear chamber; a piston rod secured to said piston and extending in a projecting direction from the piston, through said front chamber, to the exterior of the cylinder; means extending between said piston rod and said cylinder and providing part of the boundary of said front chamber; means urging said piston in said projecting direction to cause said piston rod to project farther from said cylinder and to reduce the size of said front chamber; means providing a hydraulic fluid path through said piston between said front chamber and said rear chamber; means providing a restricted return path for flow of hydraulic fluid from said rear chamber

to said front chamber; and check valve means in said hydraulic fluid path for permitting substantially free flow of hydraulic fluid from said front chamber to said rear chamber as the piston moves in said projecting direction, but substantially closing off flow of hydraulic fluid through said hydraulic fluid path when the piston moves in the retracting direction, said check valve



means comprising a valve seat in said hydraulic fluid path, a ball, engageable with said valve seat, and of a size such that it closes off said hydraulic fluid path when engaged with said seat, and spring means resiliently urging said ball against said valve seat, in which the spring force of said spring means is at least thirty times the weight of said ball.

5,181,890

ELASTIC DRIVING BELT AND PROCESS FOR IDENTIFYING AND DETECTING RESIDUAL ELASTIC ELONGATIONS IN SAID BELT STRETCHED BETWEEN TWO PULLEYS

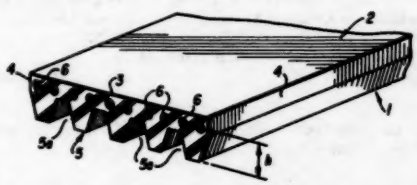
Edoardo Robecchi, Milan, Italy, assignor to Pirelli Trasmissioni Industriali S.p.A., Milan, Italy

Filed Dec. 14, 1990, Ser. No. 628,098

Claims priority, application Italy, Dec. 22, 1989, 22816 A/89

Int. Cl.[5] F16G *1/10*

U.S. Cl. 474—237 **1 Claim**



1. In a transmission system having an elastic belt with an annular body made of elastomeric material and a plurality of elastic filiform elements resistant to tensile stress which are embedded in said annular body at a position substantially corresponding to the position of a neutral axis of said annular body, said belt being bent along a first bending line defined by a circumference having a radius equal to 60% of a radius R of a circumferential development of said annular body corresponding to the position of said elastic filiform elements undergoing bending from which derives a first contraction value E1 of a radially innermost surface of said annular body and being bent along a second bending line defined by a circumference having a radius equal to a preset percent value of said radius R of said circumferential development undergoing bending from which derives a second contraction value E2 of said radially innermost surface of said annular body, said elastic belt at 1/10 of its ultimate tensile stress having an elongation value that balances a contraction value ranging between said first and said second contraction value, and at least two pulleys, said belt being mounted between said pulleys in a state of elastic pretension, the improvement comprising

i) said preset percent value is equal to 20%,

ii) said elongation is the value of a residual elastic elongation and

iii) the diameter of at least one of said pulleys is less than 15 mm.

5,181,891

DRIVE DEVICE FOR AN ADJUSTABLE PART OF A VEHICLE

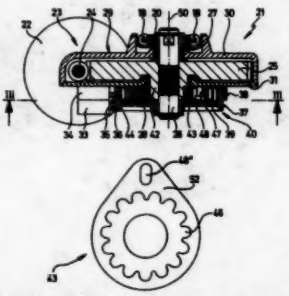
Peter Pohl, Krailling, and Reinhold Gruber, Stockdorf, both of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Stockdorf, Fed. Rep. of Germany

Filed Jul. 10, 1991, Ser. No. 727,627

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1990, 4021973

Int. Cl.[5] B60J *7/04*

U.S. Cl. 475—162 **20 Claims**



1. Drive device for displacing a vehicle part between end positions, comprising an electric motor that is connected by a reduction gear to a driving pinion located on a drive shaft, the driving pinion being connected to the vehicle part so as to drive it, a switching device controlling the motor to stop the motor in at least one predetermined position of the vehicle part, a switch wheel for actuating the switching device, and an eccentric gear train which, during displacement of the vehicle part between its end positions, causes the switch wheel to rotate less than 360°, the eccentric gear train having an external body internal gear with an internal toothing which is coaxial to a common shaft of the reduction gear and eccentric gear train, an eccentric disk that is connected to the common shaft for rotation therewith, and an internal body external gear that has an external toothing which is meshed with the eccentric gear train and has at least one tooth less than the external body internal gear, the internal body external gear being supported on the eccentric disk and being rotatable with the eccentric disk; wherein the internal body external gear is prevented from rotating with the external body internal gear and is guided by a single stationary guide bolt for movement back and forth along an adjusting axis that intersects the axis of the common shaft while wobbling about said stationary guide bolt, said guide bolt engaging in a radial recess of the internal body external gear; and wherein the external body internal gear is connected to the switch wheel for rotation therewith.

5,181,892

Patent Not Issued For This Number

5,181,893

TRANSMISSION FOR VEHICLE

Noboru Ashikawa; Bunsho Yaguchi; Toyoshi Yasuda; Masami Takano; Akihito Ohhashi; Hiroyuki Shimada, and Masahiro Akioka, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 799,548

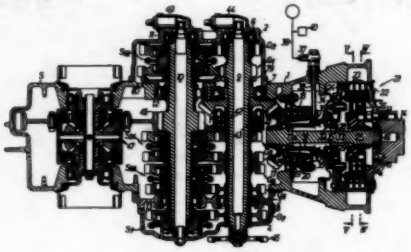
Claims priority, application Japan, Nov. 30, 1990, 2-336578; Nov. 30, 1990, 2-336584

Int. Cl.[5] F16H *37/08*

U.S. Cl. 475—203 **10 Claims**

1. The transmission for a vehicle comprising

a main shaft to which the rotation of a crankshaft is transmitted,



a counter shaft disposed in parallel to said main shaft,

a plurality of gear trains interposed between said main shaft and said counter shaft,

a shift mechanism for connecting both the shafts by any of the gear trains for establishing a desired shift stage, and

a synchro mechanism for synchronizing the speed of rotation of both said shafts when said shift stage is established,

said main shaft and said counter shaft being disposed perpendicular to an axis of said crankshaft, wherein the axis of said crankshaft intersects intermediate portions of said main shaft and said counter shaft.

5,181,894

SKI-PRACTICING DEVICE

Chen M. Shieng, No. 1-18, Tuku Tsun, Jenteh Hsiang, Taihan Hsien, Taiwan

Filed May 19, 1992, Ser. No. 885,944

Int. Cl.[5] A63B *22/00*

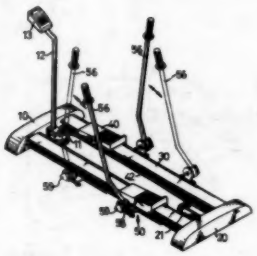
U.S. Cl. 482—70 **3 Claims**

1. A ski-practicing device comprising:

front and rear base members and two longitudinal members disposed in parallel relation therebetween, a sliding pedal being slidably mounted on each said longitudinal member;

a sliding means slidably mounted in each said longitudinal member;

a stick assembly pivotally attached to each said sliding means by a pivotal means, thereby allowing said stick assembly to be slidable relative to said longitudinal member via said sliding means, and allowing an outward pivotal movement of said stick assembly and said pivotal means relative to said sliding means, said stick assembly being forward and rearward pivotal relative to said pivotal means wherein said sliding means comprises a substantially L-shaped plate having a vertical portion on which rollers are mounted to be slidable in inner tracks formed in said longitudinal member and a horizontal portion to which said stick assembly is attached.



5,181,895

LEG EXERCISE APPARATUS AND METHOD

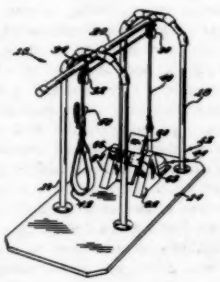
Randall Larson, and Gloria A. Larson, both of Columbia, S.C., assignors to Advanced Therapeutics, Inc., Columbia, S.C.

Filed Dec. 19, 1991, Ser. No. 810,286

Int. Cl.[5] A63B *21/06, 23/10*

U.S. Cl. 482—93 **16 Claims**

1. An apparatus for exercising muscles of a user's leg, said apparatus comprising:



a frame;

means for engaging the posterior aspect of the knee of said

leg, said engaging means carried by said frame, said engaging means is a sling, said sling adapted to be positioned against the posterior aspect of said knee;

means for resisting but not preventing movement of said engaging means by muscles of said leg, said resisting means carried by said frame and in operative connection with said engaging means,

said resisting means having a first position and a second position, said resisting means being in said first position when said leg is bent at the knee and in said second position when said leg is straightened,

said resisting means applying no resistance when in said first position and applying resistance when in said second position, so that resistance is applied when straightening said leg; and

a foot rest pivotally attached to said frame and spaced apart from said engaging means.

5,181,896

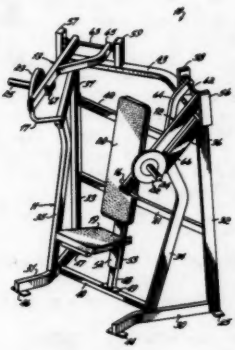
INCLINE PRESS EXERCISE MACHINE

Gary A. Jones, Falmouth, Ky., assignor to The Hammer Corporation, Cincinnati, Ohio

Filed Jun. 25, 1991, Ser. No. 720,411
Int. Cl.[5] A63B *21/08*
U.S. Cl. 482—97 **18 Claims**

1. An incline press exercise machine comprising:

a frame;



a seat connected to the frame and adapted to support a person in a declined seated position straddling a vertical midplane;

a lever having an upper rearward end connected to the frame for pivotal movement about an axis located above the seat and along an outer vertical plane that converges toward said vertical midplane, the lever also having a lower, forward end adapted to hold a removable weight; and

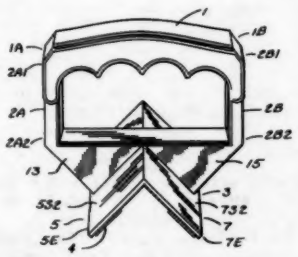
a handle connected to the lower end of the lever and adapted to be grasped and upwardly extended and adducted in an incline press motion by an exerciser supported on said seat, thereby to pivot the lever through the outer vertical plane.

5,181,897

EXERCISE APPARATUS FOR USE FOR DOING INCLINED PUSH-UP

George E. Agan, 2605 Southside Dr., Brownwood, Tex. 76801

Continuation of Ser. No. 592,965, Oct. 4, 1990, abandoned. This application Nov. 25, 1991, Ser. No. 798,836
Int. Cl.[5] A63B *23/12*
U.S. Cl. 482—141 **6 Claims**



1. An exercise apparatus for allowing a person to perform push-ups, comprising:

engaging means comprising two members, each of which have first and second sides,

each of said members having two spaced apart edges and an end portion extending between said two edges,

said two members being coupled together such that said end portions of said two members are spaced from each other with said first sides of said two members defining an angle less than 180 degrees between said end portions for engaging a non-planar support surface,

the apex of said angle being located between said two end portions and having a given length extending generally transverse to said edges,

at least one arm having first and second ends with said first end being coupled to said second side of one of said members, and

a hand grip having first and second ends defining a given length with said first end of said hand grip being coupled to said second end of said arm such that said hand grip is transverse to said arm,

said length of said hand grip being transverse to said length of said apex of said angle.

5,181,898

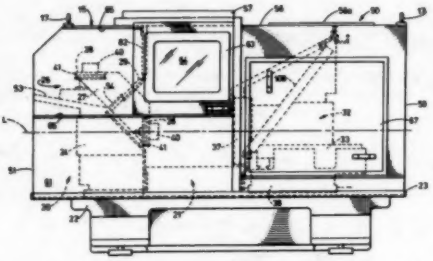
COVER ASSEMBLY FOR MULTI-CONFIGURABLE MACHINE TOOL

Tadeusz W. Piotrowski, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Sep. 16, 1991, Ser. No. 760,864
Int. Cl.[5] B23Q *3/157, 7/02*
U.S. Cl. 483—3 **20 Claims**

1. A cover assembly for a machine tool having a workhead and a workpiece changing mechanism with a pair of spaced apart workpiece transfer stations for alternately rotating workpieces between the workhead and a workpiece loading/unloading zone, said cover assembly comprising a housing substantially enclosing said machine tool and having a workpiece exchange opening, and a workpiece exchange shield attached to said housing adjacent said opening, said opening providing sufficient clearance for rotation of said workpiece changing mechanism, said shield having means for sealingly engaging said workpiece changing mechanism when in sealing position

to substantially close said opening, and means for reciprocating said shield away from said changing mechanism to an ex-



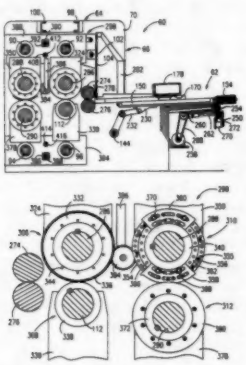
change position which accommodates the rotation of said changing mechanism without interference.

5,181,899

ADJUSTABLE SLOTTER WHEEL AND SHEET FEEDER RETROFIT APPARATUS FOR BOX BLANK MAKING MACHINES

Alan M. Hill, Topeka, and William R. Meeks, Lawrence, both of Kans., assignors to Lawrence Paper Company, Lawrence, Kans.

Filed Feb. 14, 1992, Ser. No. 835,534
Int. Cl.[5] B31B *1/14, 1/25*
U.S. Cl. 493—34 **5 Claims**



1. A blank-forming device comprising:

a scoring and slotting assembly including an elongated, rotatable scoring shaft having a rotatable blank-scoring element thereon, and an elongated, rotatable slotting shaft having a rotatable blank-slotting element carrying a fixed slotting knife and a circumferentially adjustable slotting knife, said scoring and slotting assembly being operable for sequentially scoring and slotting a sheet fed therethrough;

a feeding assembly including a shiftable pusher element movable between a retracted position and a forwardmost position and being operable during movement thereof between the retracted and forwardmost positions to feed a sheet into said scoring and slotting assembly;

means for sensing the circumferential positions of said fixed and adjustable knives;

means for sensing a reference position of said pusher element; and

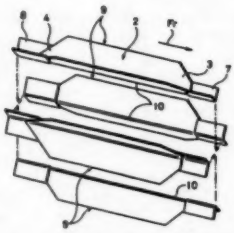
motive means for adjusting the circumferential positions of said fixed and adjustable knives, and the reference position of said pusher element, for correlating the operation of said feeding assembly with said scoring and slotting assembly.

5,181,900

METHOD OF FABRICATING A FLEXIBLE CONTAINER

Sumio Watanabe, and Nobuhiko Ishizu, both of Osaka, Japan, assignors to Taiyo Kogyo Corporation, Osaka, Japan

Division of Ser. No. 775,385, Oct. 15, 1991, Pat. No. 5,139,346. This application May 7, 1992, Ser. No. 879,383
Claims priority, application Japan, Oct. 16, 1990, 2-278652
Int. Cl.[5] B31B *33/68, 33/26, 37/16*
U.S. Cl. 493—210 **1 Claim**



1. In a method of fabricating a flexible container by sewing a plurality of sheets together, the method of fabricating a flexible container comprising:

a first step of forming three or more approximately rectangular main sheets out of a longitudinal raw material sheet;

a second step of setting an imaginary line passing through approximately the central part in the width direction of each of said main sheets to dispose a rectangular inlet sheet and outlet sheet on the imaginary line, sewing one end of each of said inlet sheet and said outlet sheet in the direction along said imaginary line to an end of the main sheet corresponding to the one end, and projecting the other end of each of said inlet sheet and said outlet sheet away from the main sheet in the direction along said imaginary line;

a third step of respectively folding assembly sheets each constituted by said three types of sheets along the imaginary lines so that outwardly folding lines of the assembly sheets due to the folding conform to one another and the surfaces of the adjacent assembly sheets on the side of the outwardly folding lines are joined to each other; and

a fourth step of sewing outer side edges of said adjacent assembly sheets together.

5,181,901

METHODS OF MAKING POP-UP PROMOTIONAL ITEMS

John K. Volkert, Northfield, Ill., assignor to Papermasters, Inc., Northfield, Ill.

Continuation-in-part of Ser. No. 463,118, Jan. 10, 1990, Pat. No. 5,078,670, which is a continuation-in-part of Ser. No. 381,047, Jul. 17, 1989, abandoned. This application Jan. 6, 1992, Ser. No. 817,281
Int. Cl.[5] B65H *37/02, 37/06*
U.S. Cl. 493—331 **12 Claims**

1. A method of making pop-up elements, which method comprises

providing a continuous web of sheet material, having a first surface and an opposite second surface, designed to provide a series of blanks for fabrication into structurally identical pop-up elements,

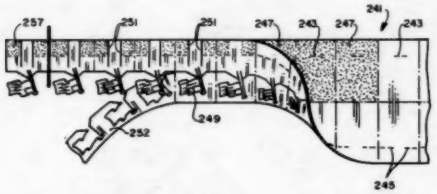
applying a first pattern of permanent adhesive to said first surface of said web,

applying a second pattern of pressure-sensitive adhesive to said second surface of said web,

folding said web along a longitudinal line so as to superimpose one portion of said first surface of said web upon said remaining portion of said first surface so that said first pattern of adhesive effects permanent joinder therebetween, and

manipulating and severing said pressure-sensitive adhesive-carrying, folded, sheet material web so as to create a stack of individual pop-up elements in alignment with one another,

said pressure-sensitive adhesive pattern being applied to said



web so that pressure-sensitive adhesive is located in the same positions on oppositely facing surfaces upon each of said pop-up elements in said stack, and said pressure-sensitive adhesive being of such a character that one adhesive-carrying surface is detachably adhered to another adhesive-carrying surface in a manner such that said pop-up elements can be readily removed one at a time from said stack,

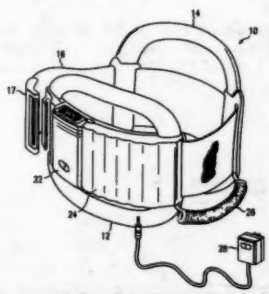
whereby said pressure-sensitive adhesive patterns allow said individual pop-up elements to be adhered to a supporting surface or between a pair of facing panels.

5,181,902

DOUBLE-TRANSDUCER SYSTEM FOR PEMF THERAPY

John H. Erickson, Plano, and John C. Tepper, Carrollton, both of Tex., assignors to American Medical Electronics, Inc., Dallas, Tex.

Filed Sep. 21, 1990, Ser. No. 586,505
Int. Cl.[5] A61N *1/00*
U.S. Cl. 600—13 **9 Claims**



1. A PEMF double-transducer system for providing PEMF therapeutic stimulation to the spine of a patient's body, comprising:

front and back transducers, both including at least a primary winding with a selected number of turns encapsulated in a shell, said shells being at least semi-rigid for providing support to the patient, said shells being anatomically contoured for situating on either side of a target area of the spine for PEMF therapy and physically coupled for releasably securing said transducers in place;

drive electronics coupled to said primary winding of both said front and back transducers for selectively activating an electromagnetic field, thereby implementing a prescribed PEMF therapy;

said drive electronics including a PEMF processor and a PEMF program for controlling said processor to energize and deenergize said transducers to implement a predetermined PEMF therapy program for the patient's spine;

said drive electronics also including circuitry for monitoring the patient's use of the PEMF system and the course of the PEMF therapy; and

a battery pack electrically connected to said drive electronics

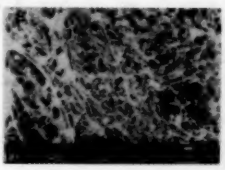
a belt supporting the front and back transducers and having compartments containing the drive electronics, the battery pack, and a buckle for releasably securing the transducers in place such that the PEMF double transducer system is portable.

5,181,903

METHOD FOR IMPROVING A BIOMATERIAL'S RESISTANCE TO THROMBOSIS AND INFECTION AND FOR IMPROVING TISSUE INGROWTH

Richard D. Vann, and Wayne A. Gerth, both of Durham, N.C., assignors to Duke University, Durham, N.C.

Filed Mar. 25, 1988, Ser. No. 173,635
Int. Cl.[5] A61F *2/06, 2/54*
U.S. Cl. 600—36 **28 Claims**



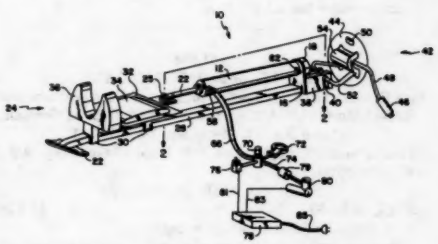
1. A method for improving a biomaterial's resistance to thrombosis and infection and for improving tissue ingrowth comprising the application of hydrostatic pressure to all surfaces of a biomaterial while it is submerged in a liquid, at a pressure and for a time sufficient to denucleate said biomaterial by displacing and/or dissolving all, or substantially all, undissolved gas from said biomaterial with said liquid.

5,181,904

PNEUMATIC TRACTION DEVICE WITH ELECTRICALLY CONTROLLED COMPRESSOR AND RELIEF VALVE

Gerry Cook, Box 1006, Sandpoint, Id. 83864, and Gary Lusin, 340 E. Hollyhock, Belgrade, Mont. 59714

Filed Oct. 24, 1988, Ser. No. 261,353
Int. Cl.[5] A61F *5/00*; A61H *1/02, 7/00*
U.S. Cl. 602—32 **4 Claims**



1. A portable pneumatic traction device comprising:

a pneumatic cylinder enclosing a pneumatic piston;

a shaft having one end connected to the pneumatic piston;

a carriage traction device connected to the shaft at the other end thereof;

a surface mounting device for mounting an end of the pneumatic cylinder to a surface;

a controllable air compressor for supplying compressed air to a pressure chamber formed within the pneumatic cylinder on a side of the pneumatic piston;

a one-way valve connected between the air compressor and the pressure chamber for preventing airflow in the direction from the pressure chamber to the air compressor but allowing airflow from the air compressor to the pressure chamber;

a controllable relief valve connected to the pressure chamber within the pneumatic cylinder for releasing air from the chamber upon opening the relief valve;

electrical control means connected to both the controllable air compressor and the controllable relief valve whereupon when the air compressor is actuated, the pneumatic traction device applies a traction force to the carriage traction device and when the relief valve is opened, the traction force applied to the carriage traction device is relaxed.

5,181,905

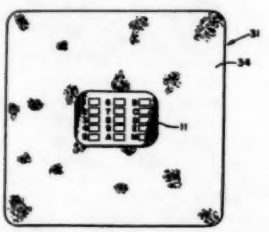
METHOD OF MONITORING THE CONDITION OF THE SKIN OR WOUND

Eric Flam, 29 Ainsworth Ave., East Brunswick, N.J. 08816

Continuation of Ser. No. 446,341, Nov. 28, 1989, abandoned. This application Sep. 10, 1991, Ser. No. 759,129

Int. Cl.[5] A61F *13/00, 15/00*

U.S. Cl. 602—41 **3 Claims**



3. The method of monitoring the degree of hydration of a wound under a wound dressing or the degree of hydration of the wound dressing itself without the need for removal of the dressing which comprises:

a) covering the wound with a dressing having a skin contacting adhesive layer comprising one or more water soluble or swellable hydrocolloids dispersed in an elastomeric substance and a backing film layer,

b) locating a temperature sensing liquid crystal tape having a plurality of indicators representative of different ranges of temperature onto the backing film of said dressing, and

c) observing the indicators and noting changes in temperature over a period of time.

5,181,906

SHOULDER-JOINT BANDAGE

Hans B. Bauerfeind, Kempen, Fed. Rep. of Germany, assignor to Bauerfeind GmbH & Co., Kempen, Fed. Rep. of Germany

Filed Jul. 22, 1991, Ser. No. 733,711

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1990, 9010801[U]

Int. Cl.[5] A61F *13/00, 15/00*

U.S. Cl. 602—63 **13 Claims**

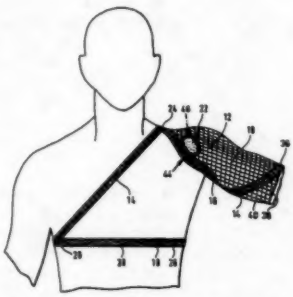
1. A shoulder joint bandage comprising:

a flexible upper arm sleeve of elastic material adapted to fit over the upper arm of a patient;

a shoulder covering cap of elastic material affixed to said sleeve and having frontal and posterior side edges adjoining at an upper edge of said cap, said sleeve having a lower edge remote from said cap;

a first strap extending from an outermost location at said lower edge along and affixed to said sleeve in a helical turn passing frontally around an underside of said sleeve and then along said posterior edge of said cap to a cross-over point at an apex of said cap, and thereafter extending diagonally downwardly from said apex across a chest of a patient to a lower cross-over point;

a second strap affixed to said sleeve and extending from said location helically in a turn along a posterior of said sleeve



around the underside thereof and then along said frontal edge of said cap to said cross-over point at said apex and thereafter diagonally downwardly along the back of said patient to said lower cross-over point; and

stitching at said cross-over points for stitching said straps together, each of said straps having attached thereto a respective connecting segment extending from said lower cross-over point around the torso of the patient so that one of said connecting segments extends over the back of the patient and the other of said connecting segments extends across the chest of the patient.

5,181,907

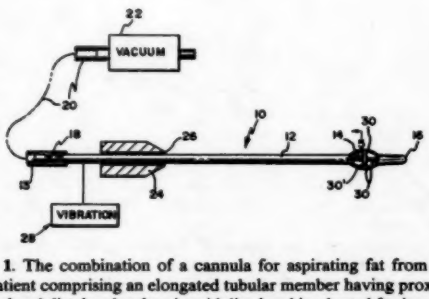
CANNULA AND METHOD FOR LIPOSUCTION

Hilton Becker, 2617 N. Flagler Dr., #304, West Palm Beach, Fla. 33407

Continuation-in-part of Ser. No. 496,039, Mar. 20, 1990, abandoned. This application Oct. 31, 1991, Ser. No. 785,801

Int. Cl.[5] A61M *1/00;* **A61B** *17/34*

U.S. Cl. 604—22 **4 Claims**



1. The combination of a cannula for aspirating fat from a patient comprising an elongated tubular member having proximal and distal ends wherein said distal end is adapted for insertion into a patient's fatty tissue through an incision in the patient's body and for being reciprocally inserted into and out of the fatty tissue by a surgeon, said elongated tubular member defining an opening near its distal end, said opening encompassing essentially the entire circumference of the tubular

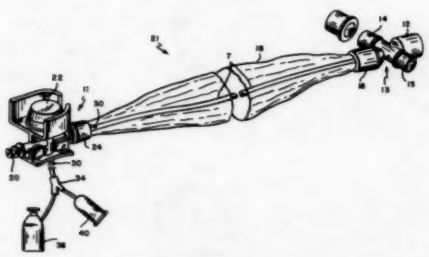
member and means forming a closed rounded or bullet-shaped end portion forwardly of the opening for facilitating its insertion into fatty tissue and passage therethrough, said tubular member further defining means including a plurality of longitudinally extending members projecting radially outwardly from the opening beyond the surface of said tubular member and extending longitudinally in the direction of said tubular member and connecting said tubular member to said bullet-shaped end portion, said longitudinally extending members having relatively thin rounded edges which are adapted to break down fat cells without damaging nerves and/or blood vessels and an annular member transverse of and connecting said longitudinal members for breaking down the fatty tissue and for preventing the area immediately adjacent the opening from coming into contact with the inner surface of a patient's skin, said elongated tubular members having a smoothly-contoured outer surface which is substantially symmetrical about its longitudinal axis between said proximal end and said opening, and vacuum means connected to the proximal end of said tubular member so that fat tissue, which is broken down by reciprocating movements of the cannula, is drawn out of the patient and through the tubular member for disposal thereof.

5,181,908

METHOD AND APPARATUS FOR LAVAGING WITH OXYGENATED IRRIGATING FLUID WHILE SUCTIONING

Craig J. Bell, Winchester, N.H., assignor to Smiths Industries Medical Systems Inc., Keene, N.H.

Filed Dec. 7, 1990, Ser. No. 624,238
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—24 **8 Claims**



1. A suction catheter suitable for use in removing undesirable fluid from a patient, said suction catheter comprising:

a tube having a proximal end and a distal end, said distal end being suitable for insertion into a patient wherein said tube includes a primary conduit for removing fluid from a patient upon application of a vacuum and a secondary conduit for providing liquid for lavaging said patient;

a cross piece mounted so as to surround said tube in the vicinity of the distal end of said tube;

a suction control means attached to said tube in the vicinity of the proximal end of said tube;

a vacuum connector at the proximal end of said suction control means;

an input tube, connected to said secondary conduit, for providing oxygenated liquid to said secondary conduit; and

a reservoir of irrigating fluid connected to said input tube, said reservoir having oxygen bubbled in through said irrigating fluid.

5,181,909

AMPULE-CONTAINER MEDICAL SYRINGE AND METHODS

Richard H. McFarlane, 2571 Kaneville Rd., Geneva, Ill. 60134

Filed May 15, 1991, Ser. No. 699,622
Int. Cl.[5] A61M *31/00*
U.S. Cl. 604—52 **31 Claims**

1. An ampule-container syringe having:

a syringe barrel with a syringe bore and a sealable luer, said bor having an injection conveyance in fluid communication with said sealable luer for attaching hypodermic needles at an injection end and suitable gripping means at a plunger-receiving end with a plunger-receiving orifice;

a syringe plunger defining an axis and insertable into the syringe bore through the plunger receiving orifice;

said plunger including a hollow plunger shaft having flexible walls defining a plunger bore sized and shaped to receive desired sizes and shapes of ampules in desired size relationships between the plunger bore and the ampules;

a plunger tip in sliding-seal relationship to inside peripheral walls of the syringe bore;

a plunger tip port having a one-way valve in one-way-valved relationship to flow of fluid from inside of the hollow plunger into the syringe bore;

suitable plunger gripping means and an ampule-insertion orifice at a handle end of the syringe plunger; and

a restraining means associated with said plunger for preventing escape of an ampule positioned in the hollow plunger shaft.

5,181,910

METHOD AND APPARATUS FOR A FLUID INFUSION SYSTEM WITH LINEARIZED FLOW RATE CHANGE

David A. Scanlon, Minneapolis, Minn., assignor to Pharmacia Deltec, Inc., St. Paul, Minn.

Filed Feb. 28, 1991, Ser. No. 662,265
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—67 **10 Claims**

1. A programmable infusion pump for administering fluid to patients, comprising:

input means for receiving (i) the total volume of fluid to be administered to the patient during the infusion cycle, (ii) an infusion period over which the fluid is to be administered, and (iii) a taper infusion period over which the rate of fluid infusion is to change linearly;

pump means for administering a fixed volume of fluid to the patient per pump activation;

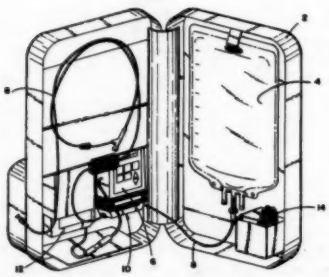
means for determining the variable time interval between pump activations necessary to produce a substantially linear rate of change of fluid flow during said taper infu-

sion period constrained by said total volume of fluid to be administered during said infusion cycle, the means for determining said variable time interval between pump activations comprising;

a) means for determining the total number of pump activations required to deliver the volume of fluid scheduled for said taper infusion period;

b) means for dividing said taper infusion period into a plurality of steps, wherein each step corresponds to a variable quantity of fluid pumped per fixed time interval;

c) means for dividing each of said steps into a number of partial pump activations so that the number of partial pump activations per step is a whole number, thereby defining a new unit of measure where each pump activation corresponds to a whole number of partial pump activations;



d) means for sequentially totaling said plurality of partial pump activations on a step-by-step basis over said taper infusion period and determining the variable time intervals where said total number of partial activations equals or exceeds one complete pump activation, the means for sequentially totaling further including means for retaining the number of partial pump activations in excess of one complete pump activation and adding said number of partial pump activations in excess of one complete pump activation to the next total of partial pump activations in the sequence;

e) means for determining said variable time interval between pump activations according to when said total number of partial pump activations equals one complete pump activation; and

pump control means for initiating said pump means in accordance with said variable time interval between pump activations to produce said substantially linear rate of change.

5,181,911

HELICAL BALLOON PERFUSION ANGIOPLASTY CATHETER

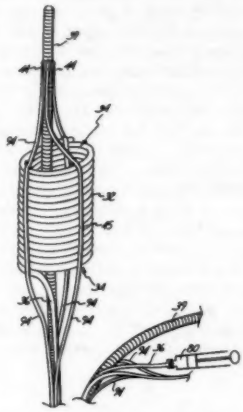
Leonid Shturman, Minneapolis, Minn., assignor to Shturman Technologies, Inc., Minneapolis, Minn.

Filed Apr. 22, 1991, Ser. No. 689,361

Int. Cl.[5] A61M *29/00*

U.S. Cl. 604—96 **31 Claims**

1. A helical balloon catheter comprising an inflatable tube having a proximal, generally straight portion and a distal, helically coiled portion, the helically coiled portion being inflatable from a deflated, furled configuration having a relatively smaller inner and outer diameter to an inflated, unfurled configuration having a relatively larger inner and outer diameter and defining a generally open, central lumen, the balloon



further including means for securing turns of the coiled portion with respect to one another.

5,181,912

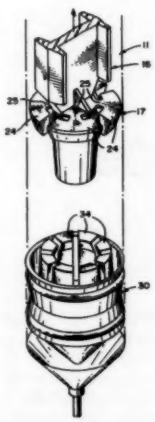
NON-REUSABLE SYRINGE

Roy Hammett, 16103 Carden Dr., Odessa, Fla. 33556

Filed Dec. 5, 1991, Ser. No. 802,628

Int. Cl.[5] A61M *5/00*

U.S. Cl. 604—110 **12 Claims**



1. A non-reusable syringe, comprising:

an elongate cylindrical barrel having adapter means on one end for attachment of a needle, and an open other end;

a two-piece plunger and piston assembly reciprocable in the barrel between a forward position in the barrel and a retracted position, said plunger having a forward end in the barrel and a rearward end accessible exteriorly of the barrel for operating the plunger;

said piston being carried directly on the forward end of the plunger for effecting a sliding seal with the barrel to draw material into the barrel and discharge it therefrom through said one end upon reciprocating motion of the plunger and piston assembly in the barrel; and

releasable latching means on the piston and plunger for latching the piston to the plunger during initial retraction of the plunger and piston in the barrel, and for unlatching the piston from the plunger during forward movement thereof, so that the piston becomes disengaged from the plunger during subsequent retraction of the plunger in the barrel, said latching means including latching arms integral with the forward end of the plunger and extending radially outwardly into sliding contact with an inner surface of the barrel, said latching arms having a first position in latching engagement with detent means on the piston to retain the piston on the plunger, and being movable to a second, over-center, unlatched position releasing the piston from the plunger as the plunger is reciprocated first toward and then away from said one end of the barrel.

5,181,913

CATHETER WITH CHECK VALVE AND ROLLED SHEATH

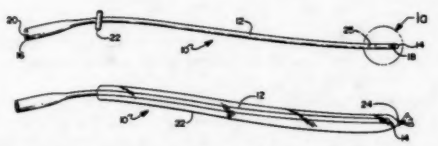
Frederick Erlich, Southfield, Mich., assignor to PRN Services, Inc., Royal Oak, Mich.

Continuation-in-part of Ser. No. 240,268, Sep. 6, 1988, Pat. No. 4,943,284, which is a continuation of Ser. No. 23,813, Mar. 9, 1987, Pat. No. 4,772,275. This application Jul. 23, 1990, Ser. No. 556,841

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—263 **4 Claims**



1. A disposable device for a single time transfer of body fluids comprising:

a hollow, tubular catheter having a first end and a second end, and having at least one inlet disposed proximate the first end thereof and at least one outlet disposed proximate the second end;

a check valve disposed in the catheter for substantially limiting the fluid flow therethrough to a single direction;

a tubular normally rolled-up sheath disposed around the catheter medial the first end and the second end, the sheath being unrollable with a portion thereof extending past the first end of the catheter after use;

means for sealing the portion of sheath extending beyond the first end of the catheter after the sheath is unrolled; and

wherein substantially the entire portion of the tubular catheter is enclosable and sealable within the sheath after use.

5,181,914

MEDICATING DEVICE FOR NAILS AND ADJACENT TISSUE

Gerald P. Zook, 9708 Woodlawn Ave. N., Seattle, Wash. 98103

Continuation-in-part of Ser. No. 395,186, Aug. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 234,585, Aug. 22, 1988, abandoned. This application May 6, 1992, Ser. No. 879,792

Int. Cl.[5] A61F *13/02*

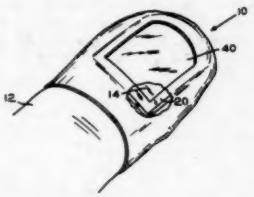
U.S. Cl. 604—307 **10 Claims**

1. A medicating device for human nails and adjacent tissue comprising:

a. a viscoelastic gel pad, having an upper surface, a lower surface, and a lateral perimeter;

b. a flexible, elastic retaining ring formed to fit closely about the lateral perimeter of said viscoelastic gel pad; said retaining ring having an upper surface and a lower surface, and bounding a central area wherein said viscoelastic gel pad is located;

c. an impermeable, elastic sheet member, attached about the upper surface of said retaining ring, which provides an occlusive layer adjacent to said upper surface of said viscoelastic gel pad;



d. a thin, porous meshwork affixed to said retaining ring and extending across said central area of said retaining ring to support said viscoelastic gel pad within said central area; and

e. means for attaching said viscoelastic gel pad and said flexible elastic retaining ring with affixed porous meshwork to a digit of a wearer.

5,181,915

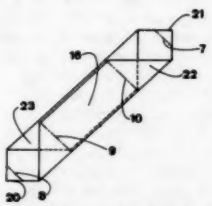
REUSABLE DIAPER

Marshall D. Smith, P.O. Box 11, Atmora, Ala. 36504

Filed Nov. 15, 1989, Ser. No. 436,591

Int. Cl.[5] A61F *13/15, 13/20*

U.S. Cl. 604—385.1 **5 Claims**



1. A reusable cloth diaper manufactured from a square sheet of cloth material having two sets of two opposed corners, with a center section having a length therebetween, and comprised of a first and second set of threads woven together, said first set of threads running in a direction perpendicular to said second set of threads and having a straight corresponding to the direction the first set of threads run and wherein a first bias with two ends and is formed in a direction diagonal to the direction which the first set of threads run, said center section having four sides, and a perpendicular bias with two ends and at right angles to the first bias, so that at each end of the first bias and perpendicular bias of the material end in opposing corners, said diaper having:

(a) the two opposed corners of one of said sets of opposed corners of the sheet folded towards the center section along the first bias of the material to form outer wings and the other two corners of the other set defining two diaper ends;

(b) the two outer wings folded towards the center section along the first bias of the material to form two outer edges of the center section;

(c) the two diaper ends folded towards the center section along the perpendicular bias to form two sides of the center section;

(d) the outer edges folded along the perpendicular bias to form two perpendicular sides of the center section leaving a rectangle of cloth and further comprising;

(e) at least one first stitch running parallel to the first bias,

said at least one first stitch extending through the outer edges and folded ends to maintain their folded configuration.

5,181,916

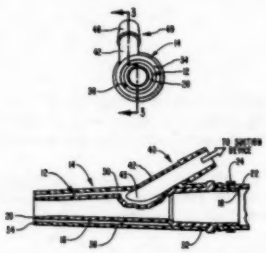
SURGICAL PROBE AND SMOKE ELIMINATOR

Valdon G. Reynolds, Bountiful; James L. Sorenson, Salt Lake City, and Gordon S. Reynolds, Bountiful, all of Utah, assignors to Sorenson Laboratories, Inc., Salt Lake City, Utah

Filed Apr. 26, 1991, Ser. No. 693,229

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—16 **21 Claims**



1. A surgical handpiece for use in applying to a target area on or in the body of a patient a surgical agent that creates an unwanted smoke plume in the vicinity of the target area, the handpiece in combination with a suction device located external to the body of the patient removing the smoke plume from the vicinity of the target area, the handpiece comprising:

(a) a surgical probe comprising a first conduit, said first conduit having a proximal end coupleable to a source of the surgical agent and a distal end opposite therefrom, said surgical probe being configured so as to apply the surgical agent to the target area by orienting the distal end of the first conduit theretoward; and

(b) a smoke eliminator comprising:

(i) a second conduit affixed to the first conduit, said second conduit having a distal end, a proximal end, and an elongate axis, the distal end of the second conduit being disposed in proximal relation to the distal end of the first conduit to define thereat a distal end of said handpiece

(ii) means for coupling the second conduit to the suction device, thereby to apply suction to the vicinity of the target area and to draw the smoke plume from the vicinity of the target area into the distal end of the second conduit and through the second conduit, defining thereby a fluid flow pathway for the smoke plume; and

(iii) means for creating a vortex in the smoke plume upstream in said fluid flow pathway from the distal end of the second conduit when the second conduit is coupled to the suction device.

5,181,917

SYSTEM AND METHOD FOR INSTRUMENTATION OF THE SPINE IN THE TREATMENT OF SPINAL DEFORMITIES

Chaim Rogozinski, 4453 Forest Dr., S., Jacksonville, Fla. 32216

Division of Ser. No. 540,635, Jun. 19, 1990, Pat. No. 5,102,412. This application Dec. 3, 1991, Ser. No. 801,899

Int. Cl.[5] A61B *11/56*

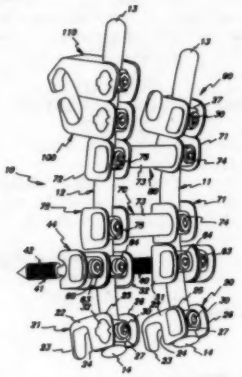
U.S. Cl. 606—61 **5 Claims**

1. A method of instrumenting the spine to correct spinal abnormalities, such as scoliosis and kyphosis, by applying axially opposed forces on the lamina of spaced vertebrae, in a direction substantially parallel to the longitudinal axis of the spine, through the use of a spinal construct having at least one elongate rod extending alongside the spine and vertebrae engaging means secured on the rod and engaged with the lamina of the vertebrae, comprising the steps of:

providing a plurality of vertebra engaging means, each having a body with a generally U-shaped open slot in a posterior surface thereof;

affixing a first vertebra engaging means to the rod at one end of the rod;

applying at least one second vertebra engaging means on the lamina of a vertebra near one end of the section of spine to be instrumented;



applying the first vertebra engaging means to the lamina of a vertebra near the other end of the section of spine to be corrected;

pivoting the rod in an anterior direction about a transverse axis at the first vertebra engaging means and laying the rod into the slotted back of the second vertebra engaging means; and

securing the rod in fixed position relative to the first and second vertebra engaging means.

5,181,918

GRANULES SYRINGE

Gerd Brandhorst, Muenchen, and Wolfgang Taeschner, Schondorf, both of Fed. Rep. of Germany, assignors to THERA Patent GmbH & Co. KG Gesellschaft Fuer Industrielle Schutzrechte, Seefeld, Fed. Rep. of Germany

Filed Aug. 2, 1991, Ser. No. 739,503

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1990. 9011685[U]

Int. Cl.[5] A61F *7/00*

U.S. Cl. 606—92 **5 Claims**

1. A syringe for impregnating granules with a liquid and for dispensing the impregnated granules, comprising

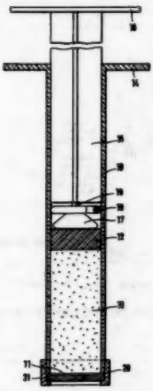
(a) a generally cylindrical barrel forming a chamber for receiving the granules and having a dispensing front end,

(b) a removable cover defining a front limitation of said chamber, said cover being permeable to said liquid,

(c) an air-permeable plug movably disposed within said barrel and defining a rear limitation of said chamber,

(d) a piston reciprocally disposed within said barrel at the rear side of said plug remote from said chamber, said piston being separate from said plug and retractable away from said plug when said granules are impregnated with the liquid, said piston contacting said plug and moving the same during the dispensing operation, and

(e) valve means disposed at the rear side of said plug, said valve means being closed when said piston is retracted



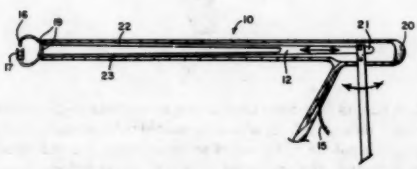
away from said front end of said barrel, and being open when said piston is advanced toward said front end.

5,181,919

SUTURE LIGATING DEVICE FOR USE WITH AN ENDOSCOPE

Arieh Bergman, 439 S. LaPeer Ave., Beverly Hills, Calif. 90211; Amos Freedy, 16943 Encino Hills Dr., Encino, Calif. 91436, and Michael Vermesh, 18142 Sandringham Ct., Northridge, Calif. 91326

Filed Apr. 23, 1991, Ser. No. 690,115
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—144 **1 Claim**



1. A suture ligating device for use with an endoscope, said suture ligating device comprising:

a. a long hollow tube which has a open end and a closed end and which is adapted to be slidably inserted into the endoscope, said open end having a inwardly beveled edge;

b. an elongated, integral member which is adapted to be slidably inserted into said long hollow tube and which is shaped like a fork having a stem having a first end and a second end, a first elongated prong having a first end and a second end and a second elongated prong having a first end and a second end, said first and second prongs being joined at said respective first ends thereof to said stem at its said first end;

c. a first scissor arm which is fixedly coupled to said long hollow tube at its said second closed end;

d. a second scissor arm which is pivotally coupled to said long hollow tube at its said second closed end and which is adapted to retract said elongated, integral member from a first position;

e. resilient biasing means for resiliently biasing said second scissor arm with respect to said first scissor arm so that said elongated, integral member is normally in said first position;

f. suture carrying means for carrying a suture, said suture carrying means being mechanically coupled to said first prong at said second end thereof;

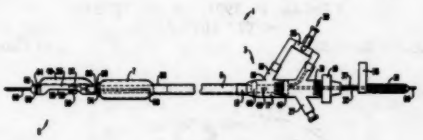
g. suture grasping means for grasping the suture, said suture grasping means being mechanically coupled to said second prong at said second end thereof whereby said suture grasping means and suture carrying means are aligned so that they become engaged when said elongated, integral member is retracted from said first position to a second position so that a slip knot can be tied externally to the endoscope.

5,181,920

ATHERECTOMY DEVICE WITH ANGIOPLASTY BALLOON AND METHOD

Richard L. Mueller, Mountain View; Brian E. Farley, Los Altos, and James F. Pfeiffer, Cupertino, all of Calif., assignors to Devices for Vascular Intervention, Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 536,041, Jun. 8, 1990, abandoned. This application Dec. 10, 1990, Ser. No. 624,855
Int. Cl.[5] A61B *17/32*
U.S. Cl. 606—159 **19 Claims**



1. In an atherectomy catheter for removal of at least a portion of a stenosis within a vessel, one elongate flexible tubular member having a torque transmitting layer, at least one lumen extending therethrough, and proximal and distal extremities, the tubular member being adapted for insertion into the vessel, a cutter housing secured to the distal end of the tubular member, flexible drive means disposed within the tubular member for rotational movement within the tubular member, a proximal actuator means for rotating said flexible drive means within the tubular member, and a cutter carried by the distal extremity of the flexible drive means and disposed in the housing for removing at least a portion of the stenosis, an inflatable dilation balloon carried by the tubular member proximally of the cutter housing and having the interior of the balloon in communication with the lumen in the flexible tubular member, means for securing a distal end of the dilation balloon to the exterior surface of the cutter housing, a shrink fit jacket extending over the torque transmitting layer and securing a proximal end of the dilation balloon to the tubular member, means for inflating and deflating the dilation balloon to further reduce the stenosis, and flexible guiding means extending forward of the cutter to travel axially within the vessel.

5,181,921

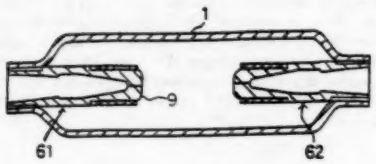
DETACHABLE BALLOON WITH TWO SELF-SEALING VALVES

Kohzoh Makita, and Tohru Machida, both of Tokyo, Japan, assignors to Kaken Co., Ltd., Tokyo, Japan

Filed May 24, 1991, Ser. No. 705,411
Claims priority, application Japan, May 25, 1990, 2-55025[U]
Int. Cl.[5] A61M *29/02*
U.S. Cl. 606—195 **5 Claims**

1. A medical instrument comprising a balloon with two self-sealing valves having an inlet for receiving a guide wire

and a catheter at one end thereof and an outlet for receiving the guide wire at another end, the two self-sealing valves are



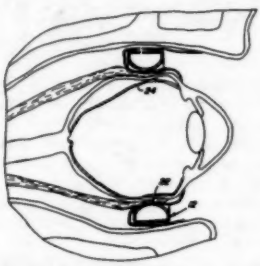
arranged at the inlet and outlet respectively and only permit fluid flow into the balloon.

5,181,922

METHOD FOR INDENTING THE OCULAR COATS OF AN EYE

Mark S. Blumenkanz, Royal Oak, Mich., and Carl Wang, Alameda, Calif., assignors to Escalon Ophthalmics, Inc., Skillman, N.J.

Filed Jul. 29, 1991, Ser. No. 737,370
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—202 14 Claims



1. A method of indenting the ocular coats of an eye, said method including the steps of: gripping the eye about the intra-forniceal bulbar conjunctival surface by surrounding the eye with an inflatable tubular member within the fornices of an eye socket, and applying a pressure about at least a portion of the bulbar conjunctival surface to indent the eye by inflating at at least a portion of the tubular member centripetally (inwardly) against the forniceal conjunctival surface to indent the eye.

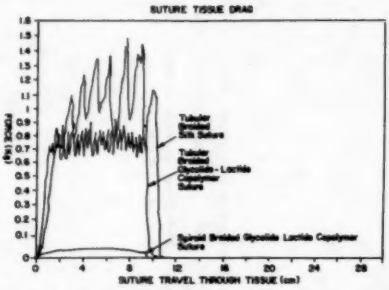
5,181,923

SPIROID BRAIDED SUTURE

Michael P. Chesterfield, Norwalk; Ilya Koyfman, Orange, and Matthew E. Hain, New Haven, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 499,173, Mar. 26, 1990, Pat. No. 5,059,213. This application Aug. 17, 1990, Ser. No. 569,063
Int. Cl.[5] A61B *17/00*
U.S. Cl. 606—228 57 Claims

1. A suture of solid spiroid braid construction coated with a composition which results in a reduced level of tissue drag for the suture compared with the tissue drag of a standard suture of the same overall denier, said suture being fabricated from a material which is susceptible to hydrolysis, the suture possessing a storage stabilizing amount of at least one water soluble,



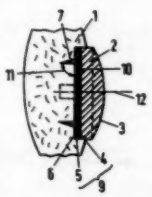
liquid polyhydroxy compound and/or ester thereof as storage stabilizing agent.

5,181,924

PATELLA PROSTHESIS

Norbert Gschwend, Zürich, and Rudolf Koch, Frauenfeld, both of Switzerland, assignors to Sulzer Medizinaltechnik AG, Winterthur, Switzerland

Filed May 26, 1992, Ser. No. 888,743
Claims priority, application Switzerland, Jul. 5, 1991, 2004/91
Int. Cl.[5] A61F *2/38*
U.S. Cl. 623—20 2 Claims



1. A patella prosthesis comprising an artificial slide member having a sliding surface, which is adapted to be mounted on the rear of the patella by means of an attachment, the sliding surface including the sector of a polyethylene sphere, which comprises a metal grid of an attachment member formed by a metal sandwich construction having a central support sheet and metal grids spot welded on both sides, with bevelled sheet metal flanges for the primary attachment of the support sheet protruding through recesses in the metal grid for being mounted in contact with the rear of the patella.

5,181,925

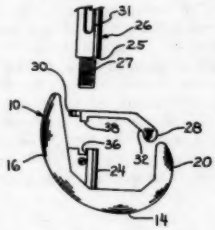
FEMORAL COMPONENT FOR A KNEE JOINT PROSTHESIS HAVING A MODULAR CAM AND STEM

Michelle L. Houston, Winona Lake, and Kevin M. Greig, Leesburg, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Continuation of Ser. No. 690,191, Apr. 22, 1991, abandoned. This application Feb. 10, 1992, Ser. No. 833,254
Int. Cl.[5] A61F *2/38*
U.S. Cl. 623—20 3 Claims

1. A modular cam for selective connection to a femoral component having a pair of spaced condyles adapted to contact a tibial component in an articulating manner, said modular cam having an elongated body terminating at opposite ends, said body having means on one end for connection to said femoral component, said body configured to extend be-

tween said condyles at said opposite end and engage a portion of said tibial component during articulation of said femoral



component to thereby limit movement of said femoral component relative to said tibial component.

5,181,926

BONE IMPLANT HAVING RELATIVELY SLIDABLE MEMBERS

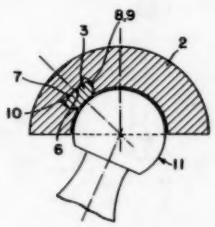
Rudolf Koch, Frauenfeld, and Robert M. Streicher, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 14, 1992, Ser. No. 820,358

Claims priority, application Switzerland, Jan. 18, 1991, 00145/91

Int. Cl.[5] A61F *2/32*

U.S. Cl. 623—22 **5 Claims**



1. A bone implant comprising

a first member of a first material having a bearing surface thereon;

a second member of a second material, said second material being softer than said first material, said second member having a bearing surface slidably engaging said bearing surface of said first member;

a plurality of support members distributed and embedded in said bearing surface of said second member, each support member having a sliding surface being made of a hard material relative to said second material and shaped to said bearing surface of said first member; and

a plurality of depressions in said second member, each depression having a respective support member therein and having a convex surface supporting said respective support member thereon, each support member having a convex surface contacting said convex surface of a respective depression and, wherein each support member has a peripheral surface of part-spherical shape and each depression has a circumferential wall of part-spherical shape.

5,181,927

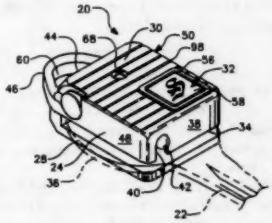
FRAME LOCK MECHANISM FOR A KEY LIGHT

Chang J. Song, 6740 Comstock Road, Richmond, B.C., Canada V7C 2X6

Filed Jul. 31, 1991, Ser. No. 738,717

Int. Cl.[5] F24V *33/00*

U.S. Cl. 362—116 **13 Claims**



1. In a key holder, apparatus for use in displaying, comprising:

a body portion of the key holder;

a frame, coupled to said body portion, said frame including a web portion and a rim portion, coupled to said web portion;

a plate, configured for engagement with said rim portion; and

a stress-inducer coupled to said body portion and to said frame wherein said rim portion is configured to move in response to stress induced by said stress-inducer so as to engage with said plate.

5,181,928

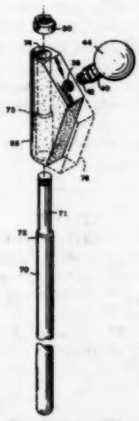
MODULAR HIP PROSTHESIS

Richard Bolesky; Todd S. Smith, and Charles E. Whitcraft, Jr., all of Warsaw, Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Continuation of Ser. No. 896,857, Aug. 15, 1986, abandoned. This application Dec. 13, 1989, Ser. No. 450,058

Int. Cl.[5] A61F *2/36, 2/32, 2/30*

U.S. Cl. 623—23 **21 Claims**



1. A kit for assembly of a hip prosthesis for replacement of a head, neck, and adjacent portions of a femur, the neck of the femur having a base defining a neck basal plane, the kit comprising:

at least two stem members having an upper portion and a lower portion, the lower portion sized to be received in a shaft of the femur,

at least two body members sized to replace a portion of the

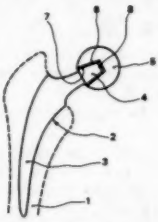
femur and each body member configured so that any one of the at least two body members is receivable over said upper portion of any one of the at least two stem members and said body member having an upper surface defining a plane generally coincident with said neck basal plane, and at least two head members sized to replace the head of the femur and including means to attach any one of the at least two said head members to any one of said at least two body members on said plane.

5,181,929

FEMORAL PROSTHESIS EMPLOYING A SMALL CERAMIC BALL

Christian Prats, Evreux, and Pierre Vivier, Paris, both of France, assignors to Ceramiques Techniques Desmarquest, Courbevoie, France

Filed Mar. 23, 1990, Ser. No. 497,625
Claims priority, application France, Mar. 23, 1989, 89 04431
Int. Cl.[5] A61F *2/34*
U.S. Cl. 623—23 **21 Claims**



1. A femoral prosthesis comprising:

a metal rod comprising a first end adapted to be implanted in a femur and a second frustoconical end having a total angle greater than 4°,

a ceramic femoral head comprising a substantially spherical body with an outer surface having a diameter which is not more than 26 mm and made of a ceramic material having a mean grain size not more than 1 micrometer, a 3 points flexion breakage modulus better than 920 MPa and an elastically modulus greater than 220 GPa,

a blind-ended recess being provided in said body and comprising an inwardly converging frustoconical shaped recess having a total angle substantially the same as said total angle of said frustoconical end of said metal rod, said frustoconical shaped recess intersecting said outer surface of said body in a circle having an entrance diameter between about 8 and about 14 mm,

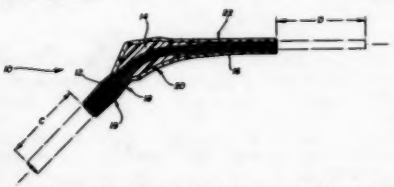
said frustoconical end of said metal rod being force-fitted in said blind-ended recess.

5,181,930

COMPOSITE ORTHOPEDIC IMPLANT

John H. Dumbleton, Ridgewood, N.J.; Ruey Y. Lin, New City, N.Y.; Casper F. Stark, Pompton Lakes, N.J., and Thomas E. Crippen, Ft. Worth, Tex., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.

Filed Apr. 10, 1991, Ser. No. 683,391
Int. Cl.[5] A61F *2/28, 2/32, 2/36*
U.S. Cl. 623—23 **20 Claims**



1. A beam adapted for implantation within a bone to support a load capable of applying bending and torsional loading forces, comprising:

an elongated core formed of continuous filament fibers oriented substantially parallel [the] *to a* longitudinal axis of the beam and embedded in a thermoplastic polymer;

encasing the core, a filler comprising a thermoplastic polymer molded to said core; and

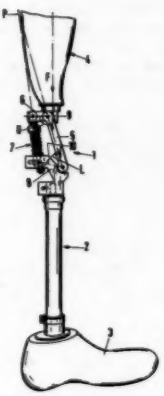
a sheath formed of filament fibers embedded in a thermoplastic polymer wound around the filler *in a helical fashion to form layers* and molded thereto *wherein the core, the filler and the sheath each have a predetermined stiffness as defined by a modulus of elasticity wherein the core has a higher modulus of elasticity than the sheath and the sheath has a higher modulus of elasticity than said filler.*

5,181,931

SWIVEL CONNECTION BETWEEN TWO PARTS OF AN ORTHOPEDIC TECHNICAL AID

Paul G. van de Veen, Enschede, Netherlands, assignor to Otto Bock Orthopaedische Industrie Besitz- und Verwaltungs-Kommanditgesellschaft, Duderstadt, Fed. Rep. of Germany

Filed Jan. 28, 1991, Ser. No. 647,027
Claims priority, application Netherlands, Jan. 26, 1990, 9000195; Fed. Rep. of Germany, Feb. 19, 1990, 4004988
Int. Cl.[5] A61F *2/64, 2/68*
U.S. Cl. 623—40 **18 Claims**



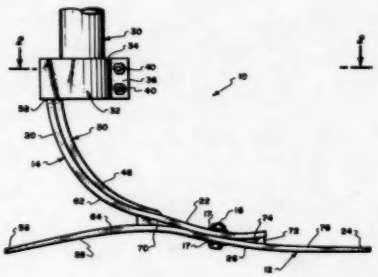
15. A swivel connection provided between two movable parts of an orthopedic device comprising a plane kinematic articulation chain having at least four articulation members and exhibiting a polycentric swiveling characteristic consisting of translatory and rotatory components, wherein a swiveling movement of at least one articulation member is limited in at least one swivel direction by a swivel stop and the length of at least one articulation member is variable by action of an external force, wherein a first part of the orthopedic technical aid constitutes a thigh prosthesis, a second part constitutes a lower leg prosthesis, and a four-membered articulation chain constitutes a knee joint, whose two articulation members connected securely to the thigh prosthesis and lower leg prosthesis, respectively, are connected to one another by a third, extensor-side coupling, articulation member used for setting the extension position and by a fourth, flexor-side couplings articulation member at articulation points, wherein the length of said fourth, flexor-side coupling, articulation member is variable in a spring-elastic manner under load, and wherein the articula-

tion point connecting the fourth, flexor-side coupling, articulation member to a lower articulation member is arranged longitudinally displaceable within the lower articulation member and can be fixed in a desired position.

5,181,932
FOOT PROSTHESIS HAVING AUXILIARY ANKLE CONSTRUCTION

Van L. Phillips, 4702 San Jacinto Ter., Fallbrook, Calif. 92028

Filed Apr. 13, 1989, Ser. No. 337,374
Int. Cl.[5] A61F *2/66*
U.S. Cl. 623—52 **19 Claims**

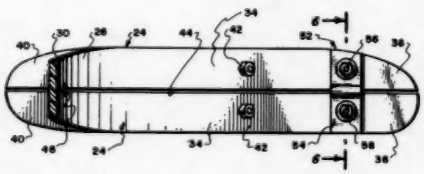


1. In a prosthetic foot, the combination of: an ankle portion incorporating upper and lower attachment sections and an elongated intermediate curvilinear ankle section capable of providing energy storage and release during utilization of said foot; a foot portion including an arch section and toe and heel sections, said toe section extending substantially forward of a forward termination point of said ankle portion; and attachment means for securing said ankle and foot portions in operative relationship with each other.

5,181,933
SPLIT FOOT PROSTHESIS

Van L. Phillips, 5499 Avenida Maravillas, Rancho Santa Fe, Calif. 92067

Filed Feb. 28, 1991, Ser. No. 662,928
Int. Cl.[5] A61F *2/66*
U.S. Cl. 623—55 **20 Claims**

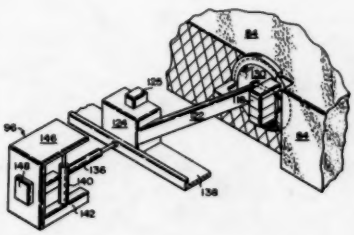


1. In a prosthetic foot, the combination of: attachment means for facilitating the operative engagement of the foot with a wearer's stump; and a plurality of curvilinear, energy-storing foot portions operatively attached to said attachment means and extending downwardly therefrom to contact a supporting surface, each of said foot portions including an ankle section, whereby said foot portions may interact with the supporting surface independently from one another, in which said plurality of curvilinear portions are of similar shape.

5,181,934
METHOD FOR AUTOMATICALLY ADJUSTING THE CUTTING DRUM POSITION OF A RESOURCE CUTTING MACHINE

Larry G. Stolarczyk, Raton, N. Mex., assignor to Stolar, Inc., Raton, N. Mex.

Division of Ser. No. 732,813, Jul. 19, 1991, Pat. No. 5,121,971, which is a division of Ser. No. 557,907, Aug. 16, 1990, Pat. No. 5,087,099, which is a division of Ser. No. 239,771, Sep. 2, 1988, Pat. No. 4,968,978. This application Mar. 16, 1992, Ser. No. 851,563
Int. Cl.[5] E21C *35/24*; D21D *23/12*
U.S. Cl. 299—1.2 **3 Claims**



1. A method for automatically adjusting the position of a cutting drum in a resource cutting machine which method comprises:

positioning an uncut resource layer detector near a cutting drum of a resource cutting machine, said uncut resource layer detector comprising a low magnetic moment spontaneous data transmission unit for measuring electrical conductance of an uncut resource;

collecting data regarding said uncut resource with said uncut resource layer detector;

converting the data collected by said uncut resource layer detector to a digital word signal format;

transmitting said digital word from said uncut resource layer detector to a minimal phase shift key modem to modulate a frequency modulated carrier signal;

inducing said modulated carrier signal to an electrical conductor and then transmitting said modulated carrier signal over said conductor to a receiver;

demodulating said modulated carrier signal and processing said demodulated signal to a processed signal representative of said collected data regarding said uncut resource;

transmitting said processed signal to a first automation control unit connected to said resource cutting machine;

changing the position of said cutting drum in response to receiving said processed signal.

5,181,935

THERMAL AND PHOTOCHEMICAL STABILIZATION OF DYEINGS ON POLYAMIDE FIBERS:STERICALLY HINDERED PHENOL AND ULTRA-VIOLET ABSORBER

Gerhard Reinert, Allschwil, and Francesco Fuso, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 24, 1991, Ser. No. 705,429

Claims priority, application Switzerland, May 31, 1990, 1843/90

Int. Cl.[5] D06P *5/02;* D06M *13/43*

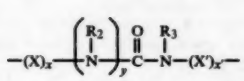
U.S. Cl. 8—442 16 Claims

1. A process for improving the thermal and/or photochemical stability of dyed polyamide fibres, which comprises treating the fibres with an agent from an aqueous bath containing

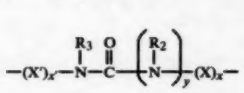
(A) a water-soluble compound of the formula

$$(A-Y-)_nZ(-W)_m \quad (1)$$

in which A is the radical of a sterically hindered phenol from the benzene series, Y is a radical of the formulae (2) or (3)



(2)



(3)

in which X and X', independently of one another, are alkylene, oxaalkylene or thiaalkylene, R_2 and R_3, independently of one another, are hydrogen or a substituted or unsubstituted alkyl group and x,x' and y, independently of one another, are each 0, or 1, Z is an aliphatic or a carbocyclic aromatic radical, the latter containing at most two mono- or bicyclic rings, W is a sulfo group and m and n, independently of one another, are 1 or 2, and their water-soluble salts, and

(B) a UV absorber,

wherein the compound of formula (1) and the UV absorber goes onto the fibers by an exhaust or continuous dyeing process.

5,181,936

PROCESS FOR HEAT SEALING A COVER TO A CONTAINER

Clarence A. Meadows, Muncie, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 3, 1991, Ser. No. 753,546

Int. Cl.[5] H01M *2/00;* B32B *31/20*

U.S. Cl. 29—623.2 5 Claims

1. A method of heat-sealing a thermoplastic cover to a thermoplastic container wherein said container has a set of walls defining at least one cavity and a sealing lip extending along at least one edge of each of said walls, and said cover has a pair of parallel ribs defining a substantially continuous channel inboard the periphery of the cover and a channel floor at the bases of said ribs, said lip and channel being adapted to mate in tongue-and-groove fashion one with the other comprising the steps of:

substantially concurrently heating said floor and said lip to provide a first bead of melt in said channel at the bases of said ribs and a second bead of melt along said edge;

cooling each of said beads sufficiently to solidify only the outermost surfaces thereof so as to form a skin of said thermoplastic over a molten core of said melts;

pressing said first and second beads together in said channel so as to rupture said skins and cause said cores to coalesce one with the other and exude between said side wall and said lip; and

cooling the coalesced cores to weld said cover to said container.

5,181,937

APPARATUS FOR PRODUCTION OF SYNTHESIS GAS USING CONVECTIVE REFORMING

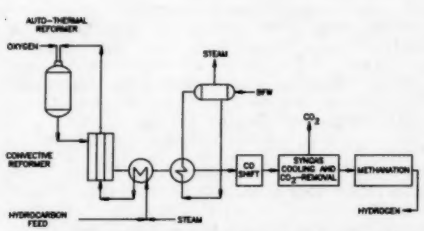
Maxim Karafian, Cold Spring Harbour, and Irving C. Tsang, Flushing, both of N.Y., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Continuation of Ser. No. 410,917, Sep. 22, 1989, abandoned, division of Ser. No. 253,542, Oct. 3, 1988, Pat No. 5,006,131, which is a division of Ser. No. 944,327, Dec. 19, 1986, Pat. No. 4,824,658, which is a division of Ser. No. 749,869, Jun. 27, 1985, abandoned. This application Feb. 25, 1991, Ser. No. 659,483

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.[5] B01J *7/00*

U.S. Cl. 48—95 7 Claims



1. A system for the steam reforming of hydrocarbons into a hydrogen-rich gas, which comprises in series:

(a) a convective reformer device having indirect heat-exchange means for partially reforming a feed mixture of hydrocarbons and steam which comprises:

(1) an outer shell enclosure comprising (i) two end portions, (ii) a cylindrical main body portion, (iii) separate inlet and outlet conduit means for the conveyance of a heating fluid and (iv) perforated distribution plate means in said inlet and outlet conduit means for delivering the heating fluid substantially uniformly to and from

(2) a core assembly within the outer shell enclosure, which comprises (i) separate inlet and outlet means at opposite ends for the flow-through of the feed mixture of hydrocarbons and steam, said inlet means consisting essentially of a fluid flow through conduit integrally connected to and able to move in concert with said core assembly, said inlet and outlet means extending through the outer shell enclosure (1) to the outside, and (ii) a multiplicity of tubular conduits open to the path of feed mixture flow, the conduits containing a particulate solid catalyst for contacting with the feed mixture, wherein outer enclosure (1) and core assembly (2) are separated by a passageway for the heating fluid which is in open communication with the heating fluid inlet and outlet means of outer shell enclosure (1), the passageway surrounding tubular conduits (ii) of core assembly (2);

(b) an auto-thermal reformer for fully reforming the partially reformed effluent from (a);
(c) a first heat exchange means which simultaneously receives the feed mixture of hydrocarbons and steam to (a) and the heat-exchanged effluent from (a);
(d) a second heat exchange means, which generates high pressure process steam;
(e) conduit means for passing the partially reformed effluent from (a) to (b);
(f) conduit means for passing the fully reformed effluent from (b) to (a) to supply the heat of reaction of the partial reformation of the hydrocarbon-steam feed mixture;
(g) conduit means for passing the feed mixture from (c) to (a);
(h) conduit means for passing the heat-exchanged effluent from (a) to (c); and
(i) conduit means for passing the effluent from (c) to (d) to supply heat for the generation of high pressure process steam.

5,181,938
COBALT-BOUND DIAMOND TOOLS, A PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Bruno E. Krismer, Goslar, and Georg Nietfeld, Bad Harzburg, both of Fed. Rep. of Germany, assignors to Hermann C. Starck Berlin GmbH & Co., Berlin, Fed. Rep. of Germany

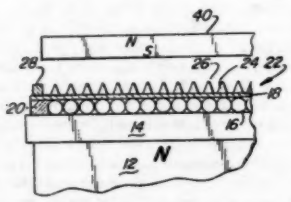
Filed Feb. 4, 1991, Ser. No. 654,761
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1990, 4007057
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 **9 Claims**

1. Cobalt-bound diamond tool comprising dispersed particles of diamond in a matrix consisting of cobalt and a uniform dispersion thereon of alloyed fine particles of boron, the overall boron content of the matrix being in the range of 0.1 to 5.0 weight percent of the matrix, the boron containing particles being of less than 5 micron size and provided in an amount and sufficiently dispersed in the cobalt to effect controllable and maintainable-in-use homogeneous matrix hardness at a selected level in the range of 200 to 650 HB 30.

5,181,939
ARTICLE AND A METHOD FOR PRODUCING AN ARTICLE HAVING A HIGH FRICTION SURFACE

Charles Neff, 384 McKinley, Grosse Pointe, Mich. 48236

Filed Dec. 20, 1989, Ser. No. 453,684
Int. Cl.[5] C09K *3/14*
U.S. Cl. 51—298 **21 Claims**



1. A structurally viable matrix having a pattern of abrasive elements for providing a working surface of a tool subsequent to a brazing operation, said matrix comprising:
a plurality of abrasive elements disposed in preselected locations, each of said abrasive elements having an element axis and a distal working portion, said distal working portions defining said working surface; and
support means comprising two constituents, a first constituent being vaporizable at a first predetermined temperature and a second constituent having a melting temperature between said first temperature and the melting point of said abrasive elements, said support means providing interconnection means between said plurality of abrasive elements and providing flexible support therefore.

5,181,940
HOLLOW FIBER MEMBRANES

Benjamin Bikson, Brookline; James T. Macheras, Quincy, and Joyce K. Nelson, Lexington, all of Mass., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Aug. 1, 1991, Ser. No. 739,322
Int. Cl.[5] B01D *53/22, 69/08;* **D01D** *5/24*
U.S. Cl. 55—16 **51 Claims**

1. A process for separating a first gaseous component from a mixture thereof with at least one other gaseous component which comprises:
1) contacting said mixture with a highly asymmetric gas separation hollow fiber membrane prepared by the process that comprises:
a) forming a mixture of fiber-forming polymer and at least one solvent, said polymer being capable of affecting separation of the first gaseous component from said at least one other gaseous component;
b) extruding the polymer-solvent mixture in the form of a hollow fiber into a gaseous atmosphere maintained at a subatmospheric pressure;
c) conveying into and solidifying the polymer-solvent mixture in a liquid medium;
d) washing the solidified polymer; and
e) recovering a solidified highly asymmetric hollow fiber membrane; and
2) recovering the component of said mixture passing selectively through the solidified highly asymmetric hollow fiber membrane; and
3) separately recovering the component of said mixture not passing selectively through the solidified highly asymmetric hollow fiber membrane.

5,181,941
MEMBRANE AND SEPARATION PROCESS

Mitri S. Najjar, Wappingers Falls, N.Y., and Carl A. Hultman, Waterford, Pa., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 16, 1991, Ser. No. 807,489
Int. Cl.[5] B01D *53/22, 69/04, 71/02*
U.S. Cl. 55—16 **20 Claims**

1. The method of separating a less permeable gas from a charge gaseous mixture containing a more permeable gas and a less permeable gas which comprises
passing a charge gaseous mixture containing more permeable and a less permeable gas into contact with a thin, dense separating membrane layer containing Group VIII noble metal on a porous graphite body;
maintaining a pressure drop across said thin, dense separating membrane layer containing Group VIII noble metal on a porous graphite body thereby forming a retentate containing a decreased content of said more permeable gas and a permeate containing an increased content of said less permeable gas;
recovering said retentate containing a decreased content of said more permeable gas from the high pressure side of said thin, dense separating membrane layer containing Group VIII noble metal on a porous graphite body; and
recovering said permeate containing an increased content of said more permeable gas from the low pressure side of said thin dense separating membrane layer containing Group VIII noble metal on a porous graphite body.

4. The method of preparing a membrane suitable for use in separating a mixture of more permeable gas and less permeable gas which comprises
maintaining, in a graphite container, at 500° C.–1300° C. a molten salt bath containing at least one halide of an alkali metal or an alkaline earth metal and a source of Group VIII noble metal;

maintaining in said molten salt bath (i) an anode, submerged beneath the surface of said bath, and (ii) a porous graphite cathode;

passing a direct current through said cathode, said bath, and said anode at cathode current density of 0.1–4 asd thereby depositing on said cathode a thin, dense membrane layer of Group VIII noble metal; and

recovering said cathode bearing a thin, dense membrane layer of Group VIII noble metal.

5,181,942

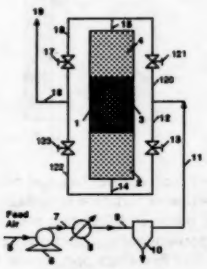
CONTINUOUS METHOD FOR REMOVING OIL VAPOR FROM FEED GASES CONTAINING WATER VAPOR

Ravi Jain, Piscataway, N.J., assignor to The BOC Group, Inc., New Providence, N.J.

Filed Dec. 13, 1990, Ser. No. 626,797

Int. Cl.[5] B01D *53/04*

U.S. Cl. 55—31 **23 Claims**



1. A two-phase cyclic method for removing oil vapor from a water vapor- and oil vapor-containing feed gas and delivering the substantially oil vapor-free feed gas to a downstream system, the first phase comprising:

flowing the water vapor- and oil vapor-containing feed gas through a regenerated first water vapor-adsorbing bed, thereby dehumidifying the feed gas;

then flowing the dehumidified feed gas through an oil vapor-adsorbing bed which operates in a non-regenerative mode with respect to oil vapor, thereby removing substantially all of the oil vapor from the dehumidified feed gas;

then flowing the dehumidified, substantially oil vapor-free feed gas through a second water vapor-adsorbing bed which contains water vapor, thereby rehumidifying said feed gas and regenerating said second water vapor-adsorbing bed;

then flowing the rehumidified, substantially oil vapor-free feed gas from said second water vapor-adsorbing bed to said downstream system;

and the second phase comprising:

flowing the water vapor- and oil vapor-containing feed gas through said regenerated second water vapor-adsorbing bed, thereby dehumidifying the feed gas;

then flowing the dehumidified feed gas through said oil vapor-adsorbing bed, thereby removing substantially all of the oil vapor from the dehumidified feed gas;

then flowing the dehumidified, substantially oil vapor-free feed gas through said first water vapor-adsorbing bed, thereby rehumidifying said feed gas and regenerating said first water vapor-adsorbing bed;

then flowing the rehumidified, substantially oil vapor-free feed gas from said first water vapor-adsorbing bed to said downstream system;

the first phase ending and the second phase beginning when the concentration of water vapor in said first water vapor-adsorbing bed reaches a predetermined level, and the second phase ending and the first phase beginning when the concentration of water vapor in said second water vapor-adsorbing bed reaches said predetermined level, and the first and second phases being repeated to provide a substantially continuous flow of substantially oil vapor-free gas to said downstream system.

20. An adsorption apparatus for removing oil vapor from a feed gas containing water vapor which comprises:

(A) a purification vessel having an inlet end and an outlet end and containing three adjacent adsorption layers which comprise:

(a) a first adsorption layer comprising a regenerable desiccant;

(b) a second adsorption layer comprising an oil vapor adsorbent which operates in a non-regenerative mode with respect to oil vapor;

(c) a third adsorption layer comprising a regenerable desiccant;

wherein the first adsorption layer is adjacent to the inlet end of the purification vessel and the third adsorption layer is adjacent to the outlet end of the purification vessel;

(B) a source of a feed gas containing oil vapor and water vapor connected to the inlet end of the purification vessel by a conduit containing a switching valve and to the outlet end of the purification vessel by a conduit containing a switching valve; and

(C) a downstream system, for receiving oil-free feed gas, connected to the outlet end of the purification vessel by a conduit containing a switching valve and to the inlet end of the purification vessel by a conduit containing a switching valve.

5,181,943

PROCESS AND APPARATUS FOR SEPARATING LIQUID ASH

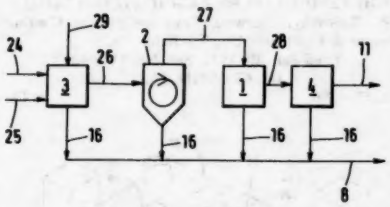
Ekkehard Weber, Essen, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 7, 1990, Ser. No. 489,572

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1989, 3907457

Int. Cl.[5] B01D *50/00*

U.S. Cl. 55—98 **19 Claims**



1. A process for separating liquid ash from an exhaust gas which is formed by combustion of a carbonaceous fuel comprising:

introducing the liquid ash containing exhaust gas stress at a temperature of from 1200° to 1800° C. into a housing means;

directing the liquid ash containing exhaust gas in the housing means onto at least one baffle surface whereby liquid ash is removed from the exhaust gas, said baffle surface being oriented substantially transversely to the direction of flow of the liquid ash containing gas; and

exhausting the gas from the housing means.

5,181,944

WET BLASTER/WET WASHER

Viljo Jarvenpaa, Kerava, Finland, assignor to Wiser Oy, Finland

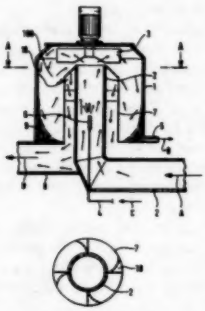
PCT No. PCT/FI91/00107, § 371 Date Nov. 18, 1991, § 102(e) Date Nov. 18, 1991, PCT Pub. No. WO91/15283, PCT Pub. Date Oct. 17, 1991

PCT Filed Apr. 10, 1991, Ser. No. 776,425

Claims priority, application Finland, Apr. 11, 1990, 901827

Int. Cl.[5] B01D *47/06*

U.S. Cl. 55—235 **6 Claims**



1. A wet blaster/wet washer for wetting a gas and for drying the excess liquid, comprising

a blaster space in which a gas is wetted and excess liquid is dried,

a central impeller located in said blaster space, said central impeller imparting a circulating movement to the gas,

a pipe located in said blaster space, said pipe having an opening toward said central impeller,

a central inlet channel arranged concentrically in said pipe, said central inlet channel directing the gas into said blaster space in an incoming direction and toward said central impeller,

at least one liquid feed located in said central inlet channel, said liquid feed injecting a first liquid into the gas such that the gas is wetted by said first liquid, and

an intermediate channel defined between said central inlet channel and said pipe, the gas being removed from said blaster space through said intermediate channel in a direction opposite to its incoming direction.

5,181,945

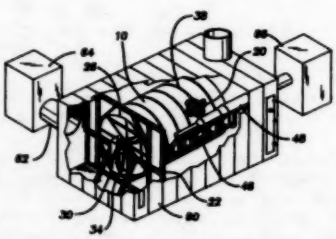
HIGH-TEMPERATURE FABRIC FILTER MEDIA

Paul W. Bodovsky, Sherman, Tex., assignor to Continental Conveyor & Equipment Co., Winfield, Ala.

Filed Jun. 10, 1991, Ser. No. 712,446

Int. Cl.[5] B01D *46/38*

U.S. Cl. 55—290 **10 Claims**



6. A fabric filtering medium for continuous use at high temperatures, consisting essentially of an aromatic polyimide fiber which is rated for continuous use at temperatures up to about 500° F., spun into a denier yarn, with said yarn knitted into a backing, and said fibers being mechanically interlocked into said knitted backing to form a tufted pile capable of filtering dirt particles from high temperature air at a rate of about 60 to 80 feet per minute per square foot of filter media at a pressure drop of less than 1.5 inch water gauge.

5,181,946

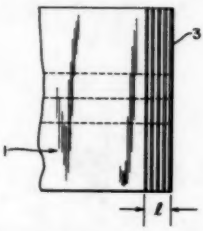
CRIMPED VACUUM BAG SEAL AND METHOD OF MAKING THE SAME

Mark D. Bosses, New York, and Yuri Milstein, Flushing, both of N.Y., assignors to Home Care Industries, Inc., Clifton, N.J.

Filed Feb. 7, 1992, Ser. No. 832,578

Int. Cl.[5] B01D *46/02*

U.S. Cl. 55—381 **12 Claims**



1. A crimped vacuum cleaner bag seal comprising:

a first sheet portion of filtration material;

a second sheet portion of filtration material, said first and said second portions being juxtaposed against one another;

at least one of said first sheet portion and said second sheet portion having at least two layers, said layers comprising at least one layer of meltblown polymeric material and at least one layer of non-meltblown material; and

a crimped region provided on said first and second sheet portions so that said first and second sheet portions are interlocked to a degree which substantially prevents passage of at least one of gas and dust through said seal.

5,181,947

METHOD FOR MANUFACTURING A GLASS FIBER

Yasuo Mizuno; Masaki Ikeda, and Akihiko Yoshida, all of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 7, 1991, Ser. No. 772,193

Claims priority, application Japan, Oct. 9, 1990, 2-271133

Int. Cl.[5] C03B *37/022*

U.S. Cl. 65—2 **9 Claims**

1. A method for manufacturing a glass fiber, comprising the steps of:

(a) pouring molten glass into a crucible having a supply port for molten glass at an upper part thereof, a nozzle having an orbicular cross section being provided at a lower part of the crucible;

(b) heating the crucible at higher temperatures than the glass melting temperature so that molten glass to be supplied from the supply port is sufficiently mixed with molten glass stored in the crucible, maintaining the higher temperatures, heating the nozzle at lower temperatures than the heating temperature of the crucible and at slightly higher temperatures than the softening point of the molten glass so that the molten glass has a predetermined viscosity, and drawing the molten glass out of the nozzle to mold a glass fiber having an orbicular cross section; and

(c) making the glass fiber drawn out of the nozzle pass through a slit having a predetermined shape specified by a pair of half metal molds which is preheated at lower temperatures than the heating temperature of the nozzle and at slightly higher temperatures than the softening point of the glass, wherein the diameter of the nozzle is ten times or less than the intended thickness of the final glass fiber.

5,181,948

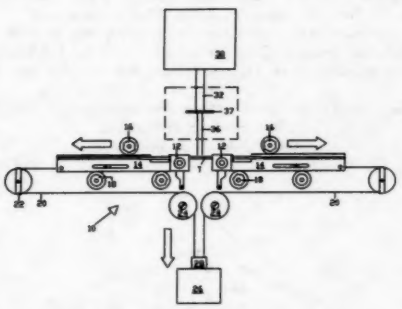
METHOD AND APPARATUS FOR FORMING MICROPIPETTE OF CONTROLLED CONFIGURATION

Jack H. Belgum, San Anselmo, Calif., assignor to Sutter Instrument Company, Novato, Calif.

Filed Jul. 12, 1991, Ser. No. 729,439

Int. Cl.[5] C03B *23/11*

U.S. Cl. 65—105 **6 Claims**



1. A micropipette puller comprising:

gripper means for securely holding a length of capillary tubing at least two spaced apart points along the length thereof;

actuated pulling means for separating said gripping means;

laser means for providing a beam of laser light having a first diameter, said laser means aligned so that said laser beam intercepts a portion of said capillary tubing between said spaced apart points; and

aperture means interposed between and in alignment with said laser means and said capillary tubing for reducing in at least one dimension said beam first diameter, thereby creating a reduced beam having a desired width, said aperture means being connected to translation means for scanning said reduced beam along a predetermined portion of said capillary tubing.

5,181,949

PUSH OUT DEVICE FOR A GLASSWARE FORMING MACHINE

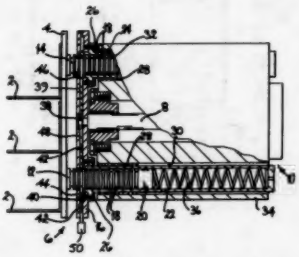
Beat Egloff, Winterthur, Switzerland, assignor to Emhart Glass Machinery Investments, Inc., Wilmington, Del.

Filed Oct. 7, 1991, Ser. No. 772,260

Claims priority, application United Kingdom, Oct. 24, 1990, 9023103

Int. Cl.[5] C03B *9/453;* B65G *47/52*

U.S. Cl. 65—375 **5 Claims**



1. A push out device for use in a glassware forming machine to remove molded containers from a dead plate of the machine to a conveyor, comprising

a piston and cylinder device including a piston rod,

a pusher head mounted on said piston rod for movement between an operative, extended, position and a retracted position, including

a support plate,

at least one container engaging finger mounted on said support plate,

a base secured to said piston rod,

a plurality of supporting rods extending through said base and parallel to said piston rod and secured to said support plate, and

securing means mounted on said base and movable between a first position engaging said supporting rods to lock said rods relative to said base and a second position releasing said rods so that the spacing between said base and said supporting plate may be adjusted.

5,181,950

PROCESS FOR COMPOSITING ORGANIC WASTE AND INSTALLATION FOR IMPLEMENTING THE PROCESS

Franz X. Kneer, Eschenburg-Eibelshausen, Fed. Rep. of Germany, assignor to Gebruder Weiss K.G., Dillenburg, Fed. Rep. of Germany

Continuation of Ser. No. 24,325, Mar. 10, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 313,287

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1986, 3607920

Int. Cl.[5] C05F *11/08;* B01J *1/00;* C02F *11/16*

U.S. Cl. 71—9 **12 Claims**

1. In a process for composting organic waste by retting comprising:

treating said waste in a first, anaerobic and aerobic decomposition step with countercurrent aeration;

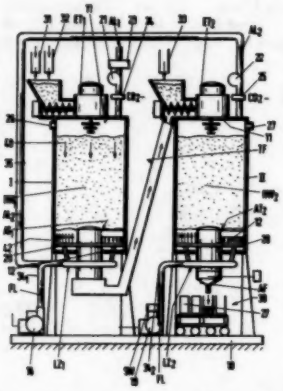
consecutively treating the resulting treated waste in a second aerobic post-retting decomposition step with countercurrent aeration by fresh air;

drawing off under suction waste air produced in said first and second step;

determining the CO_2 content in the waste air from said first and second steps; and

controlling the amount of said fresh air and said suction waste air of said aeration in said second step as a function of said determination of CO_2 in the suction waste air from said second step so as to continuously maintain aerobic

conditions in said second step; the improvement comprising



recycling the suction waste air from said second step for said aeration in said first step and controlling admixture of fresh air to said waste air as a function of said determination of CO_2 in the suction waste air from said first step.

5,181,951

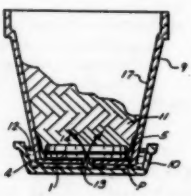
GRAVEL/FERTILIZER PACKET FOR POTTED PLANTS

Irvy E. Cosse, Jr., 4509 Gary Mikel, Metairie, La. 70002

Continuation-in-part of Ser. No. 622,737, Dec. 5, 1990, abandoned. This application Mar. 18, 1992, Ser. No. 852,315

Int. Cl.[5] C05G *3/00*

U.S. Cl. 71—64.11 **2 Claims**



2. A method of providing and maintaining a balanced nutrient and moisture content to soil in a plant pot, the pot having a base with a drain hole therein and an interior sidewall, the method preventing the egress of the soil from the drain hole in the pot, while allowing the draining of excess water therethrough, the method further providing a wicked, nutrient enhanced watering system for providing and maintaining balanced nutrient and moisture content in the soil, comprising the following steps:

(a) providing a fertilizer/filter packet, said packet comprised of fluid permeable material, the material further having a fluid wicking characteristic, such as, for example, cotton, RAYON TM and the like, said draining/wicking packet further comprising:

a main body including first and second, fluid permeable walls forming a top and a bottom, said first and second walls being configured to envelope a granular mixture of fertilizer, said first and second walls being joined together to form an edge; and

a skirt emanating at least about a half inch length from the edge of said main body;

(b) providing a pot having an inner sidewall, and a base with a drain hole formed therein;

(c) placing said fertilizer/filter packet into the base of said pot such that said skirt extends up in vertical fashion and communicates with the inner side wall, and said first wall of said main body communicates with the base, of said pot;

(d) placing soil into said pot atop said second wall of said fertilizer/filter packet, such that said soil communicates with substantially the full length of said skirt of said packet;

(e) planting a plant into said soil in said pot;

(f) watering said plant;

(g) filtering said soil from the water prior to passing through the drain hole of said pot;

(h) dissolving fertilizer from said gravel/fertilizer packet into the water, providing a nutrient rich water, wicking said nutrient rich water along the said skirt, communicating with said soil and distributing the nutrient rich water to said soil;

(i) retaining an amount of the water in the first and second side walls of said main body and said skirt of said gravel/-fertilizer packet;

(j) providing drainage of excess water through the main body and the drain hole of the pot;

(k) absorbing a quantity of water through said first wall of said main body, and into said main body, communicating the water to said fertilizer, providing a nutrient rich water;

(l) wicking the nutrient rich water through said first wall of said main body to said skirt;

(m) wicking the nutrient rich water the length of said skirt; and

(n) providing a quantity of the nutrient rich water from the skirt to the communicating soil.

5,181,952

ROOT-GROWTH-INHIBITING SHEET

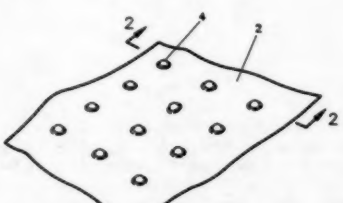
Frederick G. Burton, Stansbury Park, Utah; Dominic A. Cataldo, Kennewick; John F. Cline, Prosser, both of Wash.; W. Eugene Skiens, Wilsonville, Oreg., and Peter Van Voris, Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 86,757, Aug. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 555,113, Nov. 23, 1983, Pat. No. 5,116,414, which is a continuation-in-part of Ser. No. 314,809, Oct. 26, 1981, abandoned, and a continuation-in-part of Ser. No. 314,810, Oct. 26, 1981, abandoned. This application Jun. 11, 1990, Ser. No. 535,494

The portion of the term of this patent subsequent to May 26, 2009, has been disclaimed.

Int. Cl.[5] A01N *33/06, 33/18*

U.S. Cl. 504—347 **15 Claims**



1. A material for preventing entry of unwanted roots into a volume of soil, comprising a flexible sheet of water-permeable fabric carrying discrete spaced-apart bodies of a polymer containing a herbicidal dinitroaniline and carbon black, the concentration of said dinitroaniline in said bodies being from about 2 wt. % to about 30 wt. %, and the concentration of said carbon black being effective to retain and control the release rate of said dinitroaniline, said bodies being attached to said flexible sheet and distributed thereon in spaced-apart relationship such that when said sheet is buried in soil, said dinitroani-

line will diffuse into the volume of soil at such a rate, and over such a period of time, as to exclude roots over a period of years without killing plants beyond the seedling stage.

5,181,953

COATED CEMENTED CARBIDES AND PROCESSES FOR THE PRODUCTION OF SAME

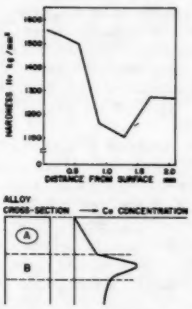
Minoru Nakano, and Toshio Nomura, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 27, 1990, Ser. No. 634,549

Claims priority, application Japan, Dec. 27, 1989, 1-344521; Dec. 27, 1989, 1-344522; Dec. 28, 1989, 1-344508; Dec. 21, 1990, 2-412717

Int. Cl.[5] C22C *29/06, 29/12;* B22F *7/04*

U.S. Cl. 75—237 **9 Claims**



1. A surface-coated cemented carbide comprising

(a) a cemented carbide substrate consisting of WC and at least one member selected from the group consisting of carbides, nitrides, and carbonitrides of Group IVb, Vb and VIb metals of the Periodic Table and a binder phase consisting of at least one member selected from the iron Group metals, in which

(b) a binder phase-enriched layer is provided between 0.05 to 2 mm below the surface of the substrate;

(c) a binder phase-depleted layer having a binder phase content less than the average quantity of the binder phase in the inner part of the binder phase-enriched layer is provided on the outer part of the said binder phase-enriched layer;

said binder phase-depleted layer having B-1 phase depleted and said substrate having substantially no eta-phase; and

(d) a monolayer or multilayer provided on the surface of said substrate consisting of at least one member selected for the group consisting of carbides, nitrides, oxides and borides of Group IVb, Vb and VIb metals of the Periodic Table, solid solutions thereof and aluminum oxide.

5,181,954

METHOD FOR COATING IRON-BEARING PARTICLES TO BE PROCESSED IN A DIRECT REDUCTION PROCESS

Jorge D. Berrun-Castanon, San Nicolas de los Garza; Maria T. Guerra-Reyes, San Pedro Garza Garcia, and Leopoldo I. Ruiz-Leal, Monterrey, all of Mexico, assignors to Hylsa S.A. de C.V., Monterrey, Mexico

Filed Jan. 14, 1991, Ser. No. 640,969

Int. Cl.[5] C21B *13/00*

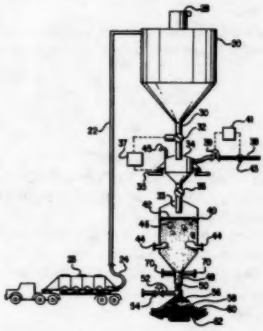
U.S. Cl. 75—433 **7 Claims**

1. Method of coating iron-bearing particles with a water-insoluble powdery material, said method comprising:

introducing said powdery material and water in predetermined quantities into a container to form a suspension;

mixing and maintaining under agitation said suspension by injecting air into said container; and

spraying said suspension from a discharge point of said container, said discharge point being proximate said iron-bearing particles, said spraying forming a coating on at least part of some of particles, and while spraying, injecting a stream of air into said suspension proximate, but upstream of said discharge point so as to regulate the amount of said suspension flowing out of the discharge point and onto the particles.



5,181,955

METHOD AND APPARATUS FOR HEATING AND SMELTING PULVEROUS SOLIDS AND FOR VOLATILIZING THE VOLATILE INGREDIENTS THEREOF IN A SUSPENSION SMELTING FURNACE

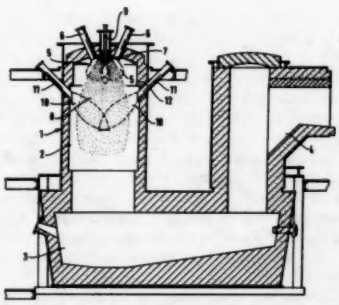
Jussi A. Asteljoki, Espoo; Jukka F. Laulumaa, Ulvila, and Launo L. Lilja, Pori, all of Finland, assignors to Outokumpu Research Oy, Pori, Finland

Filed Jan. 27, 1992, Ser. No. 826,119

Claims priority, application Finland, Feb. 13, 1991, 910690

Int. Cl.[5] C22D *7/00*

U.S. Cl. 75—443 **20 Claims**



1. A method for raising the temperature and mixing efficiency of substantially non-combustible pulverous solid particles in a suspension melting furnace, such that smelting and volatilizing is achieved, wherein:

at a first stage of heating, a mixture of oxygen or oxygen-enriched air and a fuel is supplied from at least three different burners and is made to discharge downwardly from an arch of a reaction shaft;

said mixture, when ignited, creates a short and wide flame to which flame a pulverous, substantially non-combustible solid is fed through a distributor member located in a middle area of the burners; and

said solid material is dispersed to flow down in an umbrella-like fashion; and

at a second stage of the heating, in an upper part of said reaction shaft there is arranged, symmetrically in relation to the flows, yet at least one series of burners, and the oxygen-fuel suspension fed through said one series of burners burns with a long, hot flame and smelts the suspension; and

the molten drops fall into a settler, and the gases and volatilized ingredients are discharged through an uptake shaft.

5,181,956

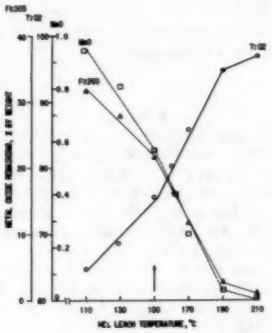
METHOD FOR PURIFYING TiO_2 ORE

Tze Chao, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 613,049, Nov. 15, 1990, which is a continuation-in-part of Ser. No. 490,195, Mar. 8, 1990, abandoned. This application May 20, 1991, Ser. No. 702,537

Int. Cl.[5] C22B *34/00*

U.S. Cl. 75—743 **20 Claims**



1. Process for reducing the amount of thorium and uranium in a titanium bearing ore selected from the group consisting essentially of titaniferous ores, leucoxene, rutile, perovskite, sphene, and derivatives thereof, comprising:

(a) contacting said titanium bearing ore, wherein said ore is characterized as containing an unacceptable level of radionuclide selected from the group consisting of thorium and uranium of greater than about 250 ppm, with an aqueous solution of a mineral acid having an acid concentration of about 3–30 percent by weight, said contacting taking place at a temperature range in excess of 150° C. up to about 300° C., until the desired amount of thorium and uranium are solubilized and a leachate is formed; and thereafter,

(b) removing and recovering the remaining ore of reduced level of radionuclide from the leachate.

5,181,957

DUST CONTROL AND ORE HANDLING AID FOR BAUXITE ORE

Anthony E. Gross, St. Charles, and Nancy L. Passantino, La-Grange Park, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jul. 19, 1991, Ser. No. 732,850

Int. Cl.[5] C09K *3/22*

U.S. Cl. 75—772 **3 Claims**

1. A method for the suppression of bauxite dust emissions from dry, finely divided bauxite ore which comprises contacting such bauxite ore with an aqueous solution of a water-soluble vinyl addition polymer selected from the group consisting of nonionic and anionic water-soluble vinyl addition polymers.

5,181,958

AQUEOUS EMULSIONS OF POLYISOCYANATES AND PROCESS FOR PREPARING THEM

Agostino Lepori, and Domenico Camaion, both of Varese, Italy, assignors to Presidenza del Consiglio dei Ministri - Ufficio del Ministro per il coordinamento delle Iniziativae per la Ricerco Scientifica e Technologica, Rome, Italy

Division of Ser. No. 740,853, Jul. 3, 1991, Pat. No. 5,108,507, which is a continuation of Ser. No. 327,607, Mar. 23, 1989, abandoned. This application Jan. 15, 1992, Ser. No. 820,790

Claims priority, application Italy, Mar. 30, 1988, 20027 A/88

Int. Cl.[5] C08L *1/28, 1/32*

U.S. Cl. 106—170 **1 Claim**

1. A process for preparing an a stabilized aqueous emulsion for use as a binding agent in wood composites consisting of at least one organic polyisocyanate and from about 0.1 to about 10% by weight of at least one cellulose ether dissolved in water at about room temperature, comprising dissolving the cellulose ether in water, and then adding the polyisocyanate at room temperature, with a stirring speed greater than 8,000 revolutions per minute for a time period of from 5 to 60 seconds.

5,181,959

HIGH-CONCENTRATION STARCH ADHESIVE

Shigeki Nagai; Haruo Sato, both of Tokyo, and Nagahisa Karube, Funabashi, all of Japan, assignors to Honshu Paper Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1989, Ser. No. 458,179

Claims priority, application Japan, Dec. 28, 1988, 63-332216

Int. Cl.[5] C08L *3/00*; C08J *3/02*; C09D *4/00, 101/00*

U.S. Cl. 106—211 **6 Claims**

1. A high-concentration starch adhesive prepared by treating a starch slurry at a temperature of 100° C. or higher to form a gelatinized solution having a starch concentration of 30–60% by weight, and then suspending an ungelatinized starch in said gelatinized solution, said high-concentration starch slurry containing a fatty acid monoester or diester of a polyethylene glycol having the following formula:

$$R—COO\text{-}(CH_2CH_2—O)_n CH_2CH_2OH$$

$$R—COO\text{-}(CH_2CH_2—O)_n CH_2CH_2OCOR'$$

wherein n represents a numeral of 10–200, and R and R' each represents a saturated or unsaturated aliphatic group having 7–31 carbon atoms.

5,181,960

Patent Not Issued For This Number

5,181,961

CEMENT COMPOSITION

Yasuhide Umaki, Funabashi; Rokuro Tomita, Urawa; Fumiaki Hondo, and Shigeru Okada, both of Kyoto, all of Japan, assignors to Nihon Cement Co., Ltd., Tokyo and Sanyo Chemical Industries, Ltd., Kyoto, both of, Japan

Continuation-in-part of Ser. No. 646,734, Jan. 22, 1991, abandoned. This application Aug. 29, 1991, Ser. No. 751,961
Claims priority, application Japan, May 22, 1989, 1-129578
Int. Cl.[5] C04B *24/02*
U.S. Cl. 106—724 6 Claims

1. A low shrinkage cement composition, comprising cement, from about 0.5 to 10 wt. %, based on the weight of cement, of at least one compound having the formula:

ROH

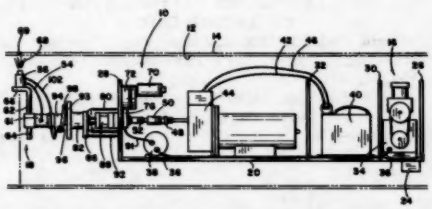
wherein R is an alkyl group having about 4 to 6 carbon atoms or a cycloalkyl group having about 5 to 6 carbon atoms, from about 0.05 to 5 wt. %, based on the weight of cement, of a water-reducing agent and water in an amount sufficient to effect hydration.

5,181,962

LIQUID SPRAY MACHINE FOR COATING INTERIOR OF PIPES

Milburn L. Hart, Tulsa, Okla., assignor to Commercial Resins Company, Tulsa, Okla.

Filed Jan. 6, 1992, Ser. No. 817,365
Int. Cl.[5] B05C *7/00*
U.S. Cl. 118—306 9 Claims



1. A spray machine for spraying liquid coating material onto interior surfaces of a pipe at girth welds, the spray machine being movable longitudinally within the pipe comprising means for movably attaching a spray gun to the spray machine, means for continuously rotating the spray gun around the interior surface of the pipe, a rotary fluid coupling having a stationary end and a rotating end, the stationary end of the coupling being attached to a source of liquid coating material, the rotating end of the coupling being in fluid communication with the spray gun in order to supply liquid coating material to the spray gun so as to spray coating material onto the interior surface of the pipe, means for repeatedly interrupting the supply of liquid coating material from the rotary fluid coupling to the spray gun.

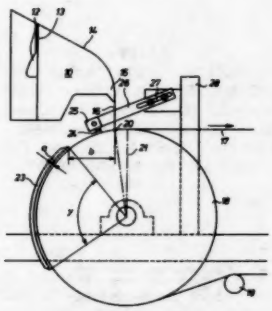
5,181,963

CURTAIN COATER FOR PHOTOGRAPHIC ELEMENTS

Dirk M. Degrauwe, St. Niklaas; Marcel A. Raemdonck, Hove, and Eduard A. Geleyns, Wilsele, all of Belgium, assignors to Agfa-Gevaert N. V., Mortsel, Belgium

Filed Jan. 22, 1991, Ser. No. 644,230
Claims priority, application European Pat. Off., Jan. 29, 1990, 90200191
Int. Cl.[5] B05C *5/00*
U.S. Cl. 118—325 7 Claims

1. In combination with a curtain coater for coating a layer of liquid coating composition on a continuous web in the manufacture of photographic material, which comprises a coating hopper for producing a free-falling curtain of coating composition extending across the web, a backing roller for supporting the moving web along an arcuately curved path underneath said hopper to receive at a coating locus on the web said curtain from said hopper, and an air shield plate that is concavely curved about a segment of said arcuately curved path with its downstream end in the direction of the coating locus in close spaced proximity to said locus and that defines with said roller a gap that forms a substantial resistance for air entrained with the moving web the improvement wherein downstream of the



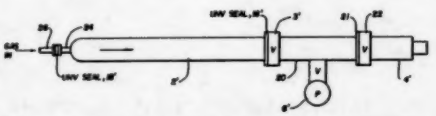
downstream end of the air shield and upstream of the curtain is located an elongated brush arrangement extending across the width of the web, said arrangement comprising flexible bristles having their ends in resilient contact with the web at a distance not larger than 25 mm upstream of the coating locus, said brush arrangement being mounted on a beam arranged for pivotation between an operative position with the bristles in contact with the web and inoperative position with the bristles removed from the web, said beam being provided with heating means.

5,181,964

SINGLE ENDED ULTRA-HIGH VACUUM CHEMICAL VAPOR DEPOSITION (UHV/CVD) REACTOR

Bernard S. Meyerson, Yorktown Height, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 13, 1990, Ser. No. 537,180
Int. Cl.[5] C23C *16/00*
U.S. Cl. 118—719 3 Claims



1. An ultra-high vacuum chemical vapor deposition reactor, comprising,

a hollow reactor tube made of quartz having an opening of a given diameter at one end and an opening having a diameter which is substantially smaller than said given diameter at the other end, which is the gas inlet end,

a first metal tube in communication with said reactor tube at said one end, there being a first ultra-high vacuum seal intermediate said reactor tube and said first metal tube, said seal being of a given circumference, corresponding to said given diameter of said reactor tube at said one end,

a metal gas inlet tube extending from said reactor tube at said gas inlet end, there being a second ultra-high vacuum seal between said reactor tube and the metal gas inlet tube, which second seal has a circumference which corresponds to the diameter of the reactor tube at said gas inlet end, said circumference of said second seal being substantially smaller than said given circumference of said first seal,

a load chamber in communication with said first metal tube for supplying objects on which a substance is to be deposited, a valve means being disposed between said first metal tube and said load chamber, and

ultra-high vacuum pumping means located only downstream of said reactor tube and communicating with said first metal tube between said reactor tube and said load chamber for pumping gas which enters through said gas inlet tube through said reactor tube.

5,181,965

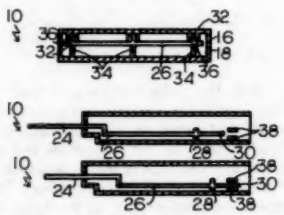
METHOD OF CLEANING ELECTRICAL CONTACTS FOR COMPUTER AND VIDEO GAMES

Louis J. Bakanowsky, III, Fitchburg, Mass., assignor to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

Division of Ser. No. 721,163, Jun. 26, 1991. This application May 12, 1992, Ser. No. 882,071

Int. Cl.[5] B08B *1/00*

U.S. Cl. 134—8 **5 Claims**



1. A method of cleaning electrical contacts within a computer or video game cartridge receptacle, which method comprises:

a) inserting a cleaning cartridge into a cartridge receptacle, the cleaning cartridge containing a board with a one and another end, one end extending outwardly from the cartridge, and the other end having a cleaning material on one or both planar surfaces thereof; and

b) slidably moving the board relative to the cartridge by a user grasping the one end of the board between an outwardly extending, non-cleaning position and an inwardly extending, cleaning position to clean the said electrical contacts.

5,181,966

HOT WATER SOLUBLE PACKAGING MATERIALS

Travis W. Honeycutt, 3544 Mill Rd., Gainesville, Ga. 30504, and Robert L. Taylor, Jr., 130 May Glen Way, Roswell, Ga. 30076

Continuation-in-part of Ser. No. 803,096, Dec. 5, 1991, which is a continuation-in-part of Ser. No. 683,290, Apr. 10, 1991. This application Jun. 30, 1992, Ser. No. 907,777

Int. Cl.[5] B08B *7/00*; C11D *17/00*

U.S. Cl. 134—42 **7 Claims**

1. A method of disposing of packaging after the contents of the packaging has been removed, said packaging having an internal space defined by thermoplastic polymer side walls being capable of dissolving in water and aqueous solutions only at temperatures above approximately 37° C., said method comprising subjecting said packaging to water at sufficient temperature to substantially dissolve said thermoplastic polymer side walls whereupon said water and dissolved packaging are subjected to disposal said thermoplastic polymer comprising a polyvinyl alcohol homopolymer that has been crystallized by postdrawing or by heat annealing.

5,181,967

METHOD OF DISPOSAL OF HOT WATER SOLUBLE UTENSILS

Travis W. Honeycutt, Norcross, Ga., assignor to Isolyser Company, Inc., Norcross, Ga.

Filed May 19, 1992, Ser. No. 884,806

Int. Cl.[5] B08B *7/00*; C11D *17/00*

U.S. Cl. 134—42 **2 Claims**

1. A method of disposing of utensils after use said utensils comprising molded, formed or extruded articles being water soluble tat temperatures only above 37° C., and not below 37° C., said method comprising subjecting said utensils after use to water at a sufficient temperature to substantially dissolve said utensils whereupon said water and dissolved utensils are subjected to disposal wherein said utensils are composed of one or more members selected from the group consisting of propyl cellulose, polyvinyl alcohol and copolymers of polyvinyl acetate and polyvinyl alcohol which have been highly crystallized by postdrawing or heat annealing.

5,181,968

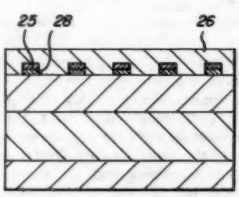
PHOTOVOLTAIC DEVICE HAVING AN IMPROVED COLLECTOR GRID

Prem Nath, Rochester Hills, and Craig Vogeli, New Baltimore, both of Mich., assignors to United Solar Systems Corporation, Troy, Mich.

Filed Jun. 24, 1991, Ser. No. 719,917

Int. Cl.[5] H01L *31/04, 31/18*

U.S. Cl. 136—256 **23 Claims**



1. A photovoltaic device having an improved charge carrier collection assembly, said device comprising an electrically conductive substrate electrode, an active body of semiconductor material disposed over the electrically conductive substrate electrode and adapted to provide for the photogeneration of charge carriers in response to light energy incident thereupon, a layer of transparent conductive material disposed over at least a portion of said body of semiconductor material to facilitate the collection of said photogenerated charge carriers, and a current collecting grid disposed over said layer of transparent conductive material, the improvement comprising in combination:

a body of conductive adhesive, having a resistivity in the range of 10,000 to 30,000 ohms per square, operatively disposed between said grid and said layer of transparent conductive oxide, whereby

said grid is secured to said layer of transparent conductive material at least in part by said body of conductive adhesive and the resistivity of said body of conductive adhesive prevents catastrophic current flow therethrough.

5,181,969

ROLLED ALUMINUM ALLOY ADAPTED FOR SUPERPLASTIC FORMING AND METHOD FOR MAKING

Toshio Komatsubara; Tsutomu Tagata, and Mamoru Matsuo, all of Tokyo, Japan, assignors to Sky Aluminum Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1991, Ser. No. 711,308

Claims priority, application Japan, Jun. 11, 1990, 2-152283; Mar. 28, 1991, 3-89893

Int. Cl.[5] B22D *25/00;* C22C *21/06*

U.S. Cl. 148—552 12 Claims

7. A method for preparing a rolled aluminum alloy adapted for superplastic forming, comprising the steps of:

forming an alloy consisting essentially of, in % by weight, 2.0 to 8.0% of Mg, 0.3 to 1.5% of Mn, 0.0001 to 0.01% of Be, less than 0.2% of Fe and less than 0.1% of Si as impurities, and the balance of Al, by melting and semicontinuous casting,

heating the cast ingot at a temperature of 400° to 560 ©C. for ½ to 24 hours,

hot rolling and then cold rolling the material into a strip of a predetermined thickness, the cold rolling step including final cold rolling to a draft of at least 30%.

5,181,970

PROCESS FOR PRODUCTION OF STAINLESS STEEL THIN STRIP AND SHEET HAVING SUPERIOR SURFACE GLOSS AND HIGH RUSTING RESISTANCE

Masanori Ueda; Masamitsu Tsuchinaga, both of Kitakyushu; Teruo Iura, Hikari, and Shigeru Fujiwara, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

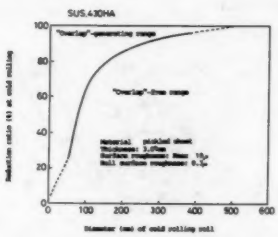
PCT No. PCT/JP89/00927, § 371 Date Jun. 13, 1990, § 102(e) Date Jun. 13, 1990, PCT Pub. No. WO90/02615, PCT Pub. Date Mar. 22, 1990

PCT Filed Sep. 8, 1989, Ser. No. 476,423

Claims priority, application Japan, Sep. 8, 1989, 63-225430

Int. Cl.[5] C21D *8/02*

U.S. Cl. 148—610 8 Claims



2. A process for the production of stainless steel thin strip and sheets having a superior surface gloss and high resulting resistance, which comprises heating a continuously cast slab or partially processed slab of frerritic or martensitic stainless steel containing 10 to 35% by weight of Cr at a temperature 1100° to 1300° C. in a combustion atmosphere having an oxygen concentration lower than 7% while adjusting the staying time of from preheating to extraction to from said atmosphere to less than about 260 minutes, carrying out hot rolling while maintaining the rolling-finish temperature at a level higher than 900° C., carrying out mechanical descaling by adding a grinding and descaling agent having a maximum particle size smaller than 400 μm to high-pressure water and spraying the mixture onto the steel strip, prickling the steel strip, cold-rolling the steel strip while maintaining the relationship between the roll diameter and the reduction ratio within the "overlap"-free region shown in FIG. 3, and subjecting the steel strip to final annealing by carrying out final annealing in a combustion gas atmosphere, and then pickling he final annealed strip.

5,181,971

MAGNET AND METHOD OF MANUFACTURING THE SAME

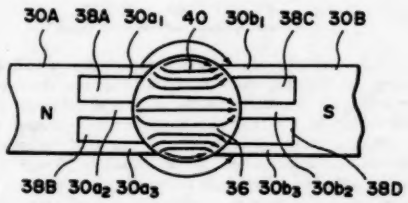
Naoji Ohtsuka, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 49,966, May 15, 1987, Pat. No. 4,954,800. This application Jan. 22, 1990, Ser. No. 468,008

Claims priority, application Japan, May 20, 1986, 61-113583; Feb. 7, 1987, 62-25583; Feb. 7, 1987, 62-25584; Feb. 7, 1987, 62-25585

Int. Cl.[5] H01F *1/02*

U.S. Cl. 148—103 4 Claims



1. A method of manufacturing a magnetic roller, comprising the steps of:

setting a molding apparatus for molding a resin material including magnetic powder into a predetermined shape, the molding apparatus having a cavity for pouring the resin material therethrough and a magnetic flux generating means for applying magnetic flux to the resin material, the cavity being defined by a non-magnetic material and pairs of magnetic pole members, with each pair having a starting magnetic pole and a terminal magnetic pole and being made of ferromagnetic material, with the number of magnetic pole members being the same as the number of magnetic poles of the magnetic roller, and wherein a plurality of magnetic pole members are positioned to generate plural magnetic peaks within a 180° circumferential angle of the molded article;

filling the molding apparatus with the resin material including the magnetic powder, with the magnetic powder being oriented so that in the central portion of the molded article the magnetic powder is substantially parallel with a magnetic line of force connecting a starting magnetic pole and a terminal magnetic pole such that the magnetic powder in a peripheral portion of the molded article converges toward the central portion of a magnetic peak of magnetic flux formed between each starting magnetic pole and terminal magnetic pole;

molding the resin material including the magnetic powder into the molded article; and

inverting the direction of some of the magnetic peaks of the molded article by polarly inverting one of the plurality of magnetic pole members within a 180° circumferential angle of the molded article so that the directions of the adjacent magnetic peaks differ from each other.

5,181,972
PROCESS FOR PRODUCING GRAIN ORIENTED SILICON STEEL SHEETS HAVING EXCELLENT MAGNETIC PROPERTIES

Michiro Komatsubara; Mitsumasa Kurosawa; Yasuyuki Hayakawa, all of Chiba; Yoshiaki Iida, Kobe, and Toshio Sadayori, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Japan

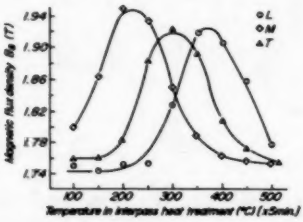
PCT No. PCT/JP90/00609, § 371 Date Jan. 9, 1991, § 102(e) Date Jan. 9, 1991, PCT Pub. No. WO90/14445, PCT Pub. Date Nov. 29, 1990

PCT Filed May 15, 1990, Ser. No. 635,511

Claims priority, application Japan, May 15, 1989, 1-120956; Jun. 15, 1989, 1-150534

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—111 **5 Claims**



1. A process for producing grain oriented silicon steel sheets having excellent magnetic properties, comprising the steps of: hot rolling a raw material for the grain oriented silicon steel; cold rolling the hot band once or twice; the hot band being intermediate annealed in between twice cold rollings and wherein cold rolling is effected at a draft of 30 to 70% by tandem rolling in a final cold rolling step, and the thus produced cold rolled sheet is continuously thermally treated in a temperature range of 200° to 400° C. for 10 seconds to 10 minutes under application of tension of not less than 0.2 kg/mm^2, and then continuously cold rolled to attain a final thickness; decarburization annealing the cold rolled sheet; coating the decarburized sheet with an annealing separator; and finish annealing the coated sheet.

5,181,973
SINTERED PERMANENT MAGNET

Kazunori Hirose; Shinya Hashimoto, both of Chiba, and Koichi Yajima, Saitama, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 1, 1991, Ser. No. 723,970

Int. Cl.[5] H01F *1/053*

U.S. Cl. 148—302 **2 Claims**

1. A sintered permanent magnet having a composition of the formula:

$$(R_{1-\alpha}Dy_\alpha)_eFe_{(100-a-b-c-d-e)}B_bAl_cSn_dM_e$$

wherein

R is at least one rare earth element exclusive of Dy,

M is at least one element selected from the group consisting of Co, Nb, W, V, Ta, Mo, Ti, Ni, Bi, Cr, Mn, Sb, Ge, Zr, Hf, Si, In, and Pb, and

letters α, a, b, c, d, and e are:

$0.01 \leqq \alpha \leqq 0.5$,

$8 \leqq a \leqq 30$,

$2 \leqq b \leqq 28$,

$0.2 \leqq c \leqq 2$,

$0.03 \leqq d \leqq 0.5$, and

$0 \leqq e \leqq 3$.

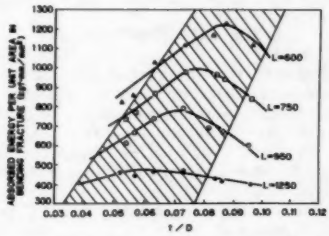
5,181,974
AUTOMOBILE BODY REINFORCING STEEL PIPE

Hiroto Tanabe, and Kazumasa Yamazaki, both of Tokai, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 25, 1991, Ser. No. 796,768

Int. Cl.[5] C22C *38/04, 38/14*

U.S. Cl. 148—320 **4 Claims**



1. An automobile body reinforcing steel pipe having a wall thickness-to-outer diameter ratio, t/D, defined by the following formula;

$$0.09-4.8\times10^{-5}\times L \leqq t/D \leqq 0.16-6.0\times10^{-5}\times L$$

where L(mm) is a span of a bending load applied to the pipe.

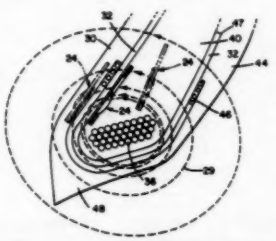
5,181,975
INTEGRATED CIRCUIT TRANSPONDER WITH COIL ANTENNA IN A PNEUMATIC TIRE FOR USE IN TIRE IDENTIFICATION

Richard S. Pollack; John R. Phelan, both of Boulder; Ronald M. Ames, Aurora; Gene R. Starkey, Longmont, all of Colo.; Robert W. Brown, Medina, Ohio; Gary T. Belski, Massillon, Ohio, and William F. Dunn, Stow, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 27, 1991, Ser. No. 676,153

Int. Cl.[5] G08B *29/00*

U.S. Cl. 152—152.1 **42 Claims**



1. A pneumatic tire having an integrated circuit transponder located within the structure of the tire for use in tire identification or data transmission, the tire having two spaced beads respectively including an annular tensile member of wound or cabled steel wire, the tire having a tread, sidewalls, an innerliner and a plurality of plies at least one of which is a continuous ply extending between the annular tensile member, respective ends of the continuous ply being turned axially and radially outwardly about the annular tensile members, the transponder having separate first and second electrodes, the transponder being able to transmit an electrical signal in response to an oscillating electromagnetic field emanating from a source in contact with or spaced from the tire, the pneumatic tire and transponder being characterized by:

an antenna having first and second leads connected respectively to the first and second electrodes of the transponder, the antenna comprising an electrical coil having a

plurality of bunched turns and an area enclosed by such turns, the perimeter of the area being defined by the closed curve formed by the locus of points centered within the bunched turns, the area being circular or oblong with a diameter or maximum dimension across the area, the maximum dimension being greater than or equal to the cross sectional dimension of the bunched turns in the direction perpendicular to the area enclosed by the turns of the coil, the coil being positioned as a secondary winding associated with one of the annular tensile members as a primary winding, the coil being positioned between the inner and outer surfaces of the tire in a location at least partially overlapping the end of the continuous ply turned about the primary winding, the coil area being substantially less than the area enclosed by the primary winding annular tensile member, such coil and member having different axes such that the coil has a varying relationship with respect to points on the sidewalls and tread of the tire, the oscillating electromagnetic field to which the transponder is responsive during interrogation enabling a magnetic field component to pass through the area enclosed by the primary winding annular tensile member causing a magnetic field to encircle the primary winding, a portion of the magnetic field encircling the primary winding passing through the area enclosed by the turns of the coil, thereby, when the magnetic field is sufficiently intense, enabling transmission of the transponder's electrical signal via the antenna.

5,181,976

PNEUMATIC TIRE HAVING EXPANDED OUTER TREAD RUBBER LAYER

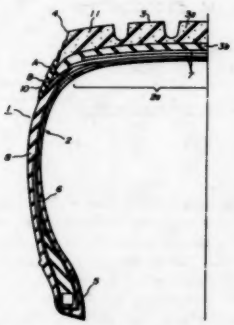
Seiichiro Iwafune, Hoyao; Kojiro Yamaguchi, Kodaira; Eiji Takiguchi, Higashiyamamto, and Toshiro Iwata, Musashimurayama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 237,202, Aug. 29, 1988, abandoned. This application Nov. 26, 1990, Ser. No. 617,472

Claims priority, application Japan, Sep. 3, 1987, 62-220697; Oct. 30, 1987, 62-275338

Int. Cl.[5] B60C *11/00*

U.S. Cl. 152—209 R **5 Claims**



1. A pneumatic tire comprising; a tire casing, a tread covering a crown portion of said casing, said tread consisting of an outer layer portion comprised of an expanded rubber layer having a volume corresponding to at least 10% of a total volume of said tread and a non-expanded rubber inner layer portion, and a non-expanded rubber reinforcing layer in a shoulder portion covering a first joint end part between said outer layer portion and said inner layer portion and a second joint end part between said inner layer portion and a sidewall portion; and said expanded rubber layer entirely formed of an expanded rubber containing no less than 50 parts by weight of at least one rubber component selected from natural rubber, polybutadiene rubber and styrene-butadiene copolymer rubber all having a glass transition temperature of not higher than −45° C., a high reinforcing carbon black having an N_2SA of 90–180 m^2/g and not more than 10 parts by weight of an oil per 100 parts by weight of said rubber component; and said expanded rubber contains closed cells at an expansion ratio (Vs) of 5–50% so that the number of closed cells having a cell diameter of 5–30 μm is not less than 50% of total number of closed cells having a cell diameter or not less than 5 μm per unit area.

5,181,977

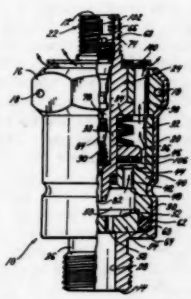
TIRE INFLATION VALVE HAVING OVERPRESSURE AND FLOW CONTROL

Donald R. Gneiding, Fullerton, and Oscar J. Peterson, Orange, both of Calif., assignors to Circle Seal Controls, Inc., Anaheim, Calif.

Continuation of Ser. No. 547,536, Jun. 29, 1990, abandoned, which is a continuation of Ser. No. 242,477, Sep. 9, 1988, abandoned. This application May 13, 1991, Ser. No. 699,477

Int. Cl.[5] B60C *23/00*

U.S. Cl. 152—429 **20 Claims**



1. A wheel mounted gas fill valve for pressurizing a pneumatic tire above ambient pressure having:

a valve housing;

an inlet gas passage in said housing having:

a first end adapted for admitting pressurizing gas from a high pressure gas source; and

a second end;

an inlet Schrader valve in said second end of said inlet gas passage oriented to normally block flow from said second end to said first end unless mechanically opened;

an outlet port in said housing distal said inlet gas passage, adapted for connection to a tire for supplying pressurized gas to the tire;

a flow limiting orifice in flow communication with said inlet gas passage;

a pressure sensing cavity in said housing, said cavity communicating said flow limiting orifice and outlet port;

valve means capable of venting said pressure sensing cavity to ambient; and

means responsive to a predetermined difference in pressure between ambient pressure and pressure in said pressure sensing cavity to open said valve means, whereby pressure in said pressure sensing cavity in excess of a predetermined absolute value above ambient pressure is limited so that gas pressure at said outlet port is limited to a predetermined maximum pressure above ambient no matter what pressure is present at said inlet passage.

5,181,978

TIRE AND RIM ASSEMBLY WITH THE TIRE HAVING 15 DEGREE TAPER BEAD PARTS

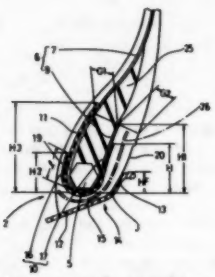
Kiyoshi Ochiai, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Nov. 23, 1990, Ser. No. 617,093

Claims priority, application Japan, Nov. 25, 1989, 1-305727; Oct. 15, 1990, 2-276700

Int. Cl.[5] B60C *15/06*

U.S. Cl. 152—541 **1 Claim**



1. A tire and rim combination comprising:

a rim, said rim including a bead seat part and a flange extending radially outward from the axis of said rim; and

a tubeless tire, said tire including 15° taper bead parts of which each base bottom surface to be seated on the bead seat part reduces in inside diameter at a 15 deg. taper inward in the axial direction from a bead heel end J,

a carcass having a main body portion extending from a tread part through sidewall parts to a bead core in each of said bead parts, and a pair of turned up portions, one of said pair of turned up portions turned up around each of the bead core from axially inside to outside and extending radially outwardly;

a first reinforcement layer of steel cords having an inside part, the inside part extending at the bead part along an axially inner surface of the main body portion, and an outside part, the outside part being contiguous to the inside part and extending along an axially outer surface of the turned up portion;

a second reinforcement layer of steel cords extending outwardly in the tire radial direction along the main body portion from a radial position substantially level with the bead heel end J, and of which a lower region is interposed between the inside part of the first reinforcement layer and the main body portion so as to form an overlapping portion with the inside part of the first reinforcement layer, wherein

the width l of the overlapping portion is in a range of 0.3 to 0.5 times the height H3 of the upper end of the second reinforcement layer in radial direction from the bead heel end J,

the height H1 of the upper end of the turned up portion in radial direction from the bead heel end J is in a range from 2.7 to 4.0 times the flange height HF of said flange.

the height H2 of the upper end of the inside part of the first reinforcement layer in the radial direction from the bead heel end J is in a range from 1.5 to 2.4 times the flange height HF, and

the ratio H3/H1 of the height H3 to the height H1 is in a range from 1.2 to 1.6; and

an intermediate rubber part interposed between the main body portion and the turned up portion in each of the bead parts, the thickness G1 of the intermediate rubber part, which is the distance between the upper end of the turned up portion and the main body portion in the direction orthogonal to the turned up portion, is in a range from 0.9 to 1.1 times the flange height HF, and the ratio G1/(G1+G2) of the thickness G1 of the intermediate rubber part to the sum of the intermediate rubber part thickness G1 and the outside rubber thickness G2, which is the distance from the upper end of the turned up portion to the outside surface of the bead part in the direction orthogonal to the turned up portion, is in a range from 0.50 to 0.60.

5,181,979

PROCESS FOR PREPARING CARBON/CARBON COMPOSITE

Seiichi Uemura; Yoshio Sobda, both of Tokyo; Osamu Kato, Kanagawa; Takefumi Kouno, Kanagawa, and Tsutomu Kihara, Kanagawa, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Apr. 8, 1991, Ser. No. 682,030

Claims priority, application Japan, Apr. 6, 1990, 2-90175

Int. Cl.[5] C01B *31/02*

U.S. Cl. 156—89 **11 Claims**

1. A process for preparing a carbon/carbon composite, which process comprises mixing 100 parts of a carbonaceous pitch with 1 to 45 parts by weight of at least one aromatic compound containing at least one functional group selected from the group consisting of nitro and hydroxyl groups, then impregnating a bundle of carbon fibers with the resulting mixture, thereafter carbonizing the thus-impregnated carbon fiber bundle under pressure and optionally, further carbonizing the thus-carbonized carbon fiber bundle at atmospheric pressure.

5,181,980

METHOD OF MANUFACTURING SKIN COVER FOR SEAT

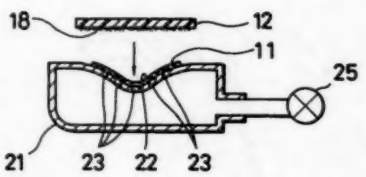
Norio Yanagishita, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 440,033, Nov. 21, 1989. This application Oct. 16, 1991, Ser. No. 776,903

Claims priority, application Japan, Dec. 24, 1988, 63-326672

Int. Cl.[5] B32B *31/04*

U.S. Cl. 156—93 **5 Claims**



1. A method of manufacturing a skin cover comprising a surface skin and a wadding attached on a back of the surface skin, the surface skin and the wadding initially having shapes which are flat and two-dimensional, the skin cover incorporating at least one section which is curved and three-dimensional, and the method comprising the steps of:

placing one of the surface skin and the wadding which is originally flat and two-dimensional in contact with a manufacturing surface having a curved shape corresponding to the three-dimensionally curved section of the skin cover and which includes a plurality of suction means for applying a suction force having a strength which is only sufficient to keep said one of the surface skin and the wadding in said curved shape, drawing said one of the surface skin and the wadding placed in contact with the manufacturing surface tightly to the manufacturing surface by the suction force applied by the suction means, and forming said one of the surface skin and the wadding in said curved shape; and

attaching the other one of the surface skin and the wadding

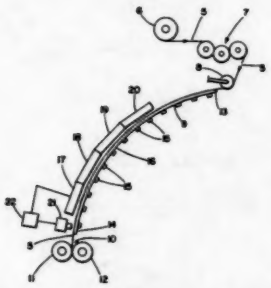
to said one of the surface skin and the wadding placed in contact with the manufacturing surface, along said curved shape in which said one of the surface skin and the wadding is formed, to obtain the skin cover incorporating said curved section.

5,181,981

METHOD OF EMBOSSING THERMOPLASTIC MATERIAL

James E. Godwin, Ethelsville, Ala., assignor to GenCorp Inc., Fairlawn, Ohio

Filed Jul. 29, 1990, Ser. No. 559,118
Int. Cl.[5] B29C *59/02*; B32B *31/16*
U.S. Cl. 156—209 **5 Claims**



1. A method of embossing a thermoplastic material in a nip which is formed between an embossing roll and a back-up roll, both of which rolls rotate about parallel, horizontal axes, comprising the steps of:

preheating a strip of thermoplastic sheet material by passing the strip in contact, sliding supported relation over a fixed surface of a heated metal platen having a plurality of perforations which are open to the atmosphere to allow for the removal of vapor to prevent distortion of the strip of thermoplastic material, the surface extending upwardly from the nip and curving arcuately above and to one side of the nip and designed to direct the strip downwardly into the nip; and embossing the strip of thermoplastic material by passing it between an embossing roll and a back-up roll.

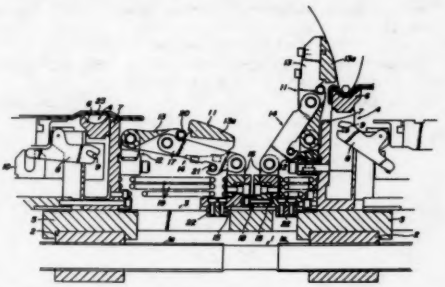
5,181,982

TIRE FORMING DRUM INCLUDING STITCHING SUPPORTS

Yuzo Kumagai, Niiza, and Kichinosuke Nishimoto, Tokyo, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 22, 1991, Ser. No. 704,258
Claims priority, application Japan, May 28, 1990, 2-135286
Int. Cl.[5] B29D *30/26*
U.S. Cl. 156—415 **4 Claims**

1. A tire forming drum including a pair of bead lock means, shaping means for forming a carcass play into a toroidal shape, ply turning-up means for turning up the ply, the two sets of a plurality of stitching supports circumferentially arranged between the pair of bead lock means, each of said stitching supports in each of the two sets comprising a rigid lever having one end pivotally connected to a housing of the bead lock means and the other end provided with a close contact portion to be brought into close contact with an inner circumferential surface of one bead portion of a tire being formed, and actuating means for each of the stitching supports comprising a rigid link having one end pivotally connected to a mid portion of the stitching support and the other end pivotally connected to one of a pair of sleeves movable in axial directions of the forming drum, the pivot point between each of the stitching supports and the rigid link associated therewith being located radially outwardly of a straight line segment connecting the pivoted point of the stitching support to the housing and the pivoted point of the rigid link to the sleeve in the collapsed state,



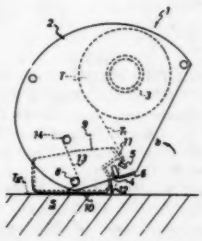
thereby enabling the stitching supports to expand by movements of the sleeves and the bead lock means arranged on both sides towards each other.

5,181,983

ADHESIVE TAPE CUTTING DEVICE

Kikuo Sakai, Tokyo, Japan, assignor to Shinwa Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1991, Ser. No. 717,493
Claims priority, application Japan, Jun. 19, 1990, 2-64557
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—523 **8 Claims**



1. An adhesive tape cutting device, comprising:

a housing having an outlet;

support means mounted inside the housing for supporting an adhesive tape roll such that the tape can be unrolled and dispensed through the outlet;

guiding means for guiding unrolled tape through the outlet;

holding means disposed within the housing for temporarily holding a portion of the unrolled tape;

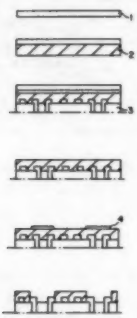
pressing and cutting means movably connected to the housing, the pressing and cutting means having a blade and being moveable between a standby position in which the pressing and cutting means is out of contact with the unrolled tape; a pressing position in which the pressing and cutting means presses the unrolled tape which has been dispensed through the outlet against a surface to which the unrolled tape is applied; an affixing position in which the pressing and cutting means affixes a portion of the unrolled tape to the holding means; and a cutting position in which the blade cuts the unrolled tape at a point between the holding means and the surface to which the unrolled tape is applied.

5,181,984

PRODUCTION OF SOLDER MASKED ELECTRIC CIRCUIT BOARDS

Akira Matsumura, Hirakata, and Katsukiyo Ishikawa, Kyoto, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Oct. 8, 1991, Ser. No. 773,119
Claims priority, application Japan, Oct. 8, 1990, 2-270959
Int. Cl.[5] B44C *1/22*; B29C *37/00*
U.S. Cl. 156—630 **3 Claims**



1. A process for producing an electric circuit board which is masked with a solder resist excepting a portion to be soldered, comprising forming an electric circuit on a substrate, coating a negative type photosensitive solder resist on the obtained electric circuit board, and then exposing to light through a negative film followed by developing, characterized in that said negative type photosensitive solder resist is electrodepositable and said coating of the solder resist is conducted by electrocoating the resist on an electroconductive transfer substrate which is different from the electric circuit board and then transferring the coated film onto the electric circuit board.

5,181,985

PROCESS FOR THE WET-CHEMICAL SURFACE TREATMENT OF SEMICONDUCTOR WAFERS

Ingolf Lampert, Burghausen, and Christa Gratzl, Neuotting, both of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Continuation of Ser. No. 359,508, Jun. 1, 1989, abandoned. This application Mar. 6, 1991, Ser. No. 666,493
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1988, 3818714
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C03C *15/00*
U.S. Cl. 156—635 **18 Claims**

1. A process for wet-chemical surface post-polishing cleaning of semiconductor wafers in a system where aqueous phases containing one or more chemically active substances having a gaseous state in solution chemically act on the surfaces of the said wafers comprising the steps of:

initially treating the water and the chemically active gaseous substances to reduce the quantity of contamination particles;

introducing an effective amount of the chemically active substances in the gaseous state into the system; said chemically active substances are selected from the group consisting of the gases of ammonia, hydrogen chloride, hydrogen fluoride, ozone, ozonized oxygen, chlorine and bromine;

introducing water at a temperature of 10° C. to 90° C. in the form of a mist into the system containing the semiconductor wafers;

producing said mist by spraying water, feeding water through nozzles or aerosolizing water;

forming the liquid phases chemically acting on the wafer surfaces within the system by the interaction of the gas phase and the mist; and

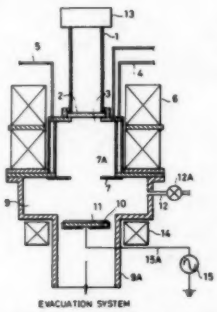
exposing said wafer surfaces to said chemically acting liquid phases.

5,181,986

PLASMA PROCESSING APPARATUS

Kiyoshi Ohiwa, Tokyo, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 19, 1991, Ser. No. 677,238
Claims priority, application Japan, Apr. 2, 1990, 2-87887
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—643 **7 Claims**



1. In a plasma processing apparatus for processing a semiconductor substrate, the apparatus having a plasma generation chamber communicating with a processing chamber for holding the substrate, a first excitation solenoid being disposed around the plasma generation chamber in a coaxial relationship therewith, a second excitation solenoid disposed in the vicinity of the semiconductor substrate, a method for plasma processing the semiconductor substrate comprising:

generating a gas plasma by flowing a gas into the plasma generation chamber, introducing microwave radiation into the plasma generation chamber and controlling a current flowing through the first excitation solenoid thereby defining a magnetic field and generating the gas plasma by a resonant effect with the microwave radiation, wherein the current is maintained within a current range in which plasma density decreases suddenly with an increase in the current; and

extracting the gas plasma from the plasma generation chamber along lines of magnetic force produced by the first excitation solenoid into the processing chamber and directing the plasma onto a surface of the semiconductor substrate disposed in the processing chamber along lines of magnetic force of a cusp-shaped magnetic field produced by the second excitation solenoid so that the plasma processes the surface of the semiconductor substrate.

5,181,987

DEVICE AND PROCESS FOR PRECIPITATING POLYMERS

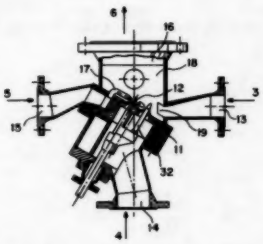
Walter Breuker, Haltern; Hans Wagner; Eckhard Möller, both of Marl, and Bernhard Schleimer, Paderborn, all of Fed. Rep. of Germany, assignors to Bunkawerke Huls GmbH, Marl, Fed. Rep. of Germany

Filed May 8, 1991, Ser. No. 696,915
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4018912
Int. Cl.[5] B01D *3/00*
U.S. Cl. 159—4.08 **19 Claims**

1. A device for precipitating polymers from a liquid by means of at least one precipitant fluid, comprising:

a nozzle plate having at least one outlet orifice for the polymer containing fluid, said outlet orifice communicating with a first feed line;

at least one nozzle for at least one precipitant fluid, said nozzle communicating with a second feed line, the axis of said nozzle being arranged approximately perpendicularly to the axis of said outlet orifice;



a precipitation chamber positioned on the side of said nozzle plate, wherein at least one said nozzle for at least one precipitant fluid is also located;

a discharge line for discharging a mixture which contains the precipitated polymer; and

a degassing chamber which is connected to said discharge line.

5,181,988

METHOD FOR PREVENTING THE DISCOLORATION OF PAPER AND PAPER TREATED TO PREVENT DISCOLORING

Mitsuo Akutsu, Tokyo, and Syuji Iwakura, Saitama, both of Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 370,031, Jun. 21, 1989, abandoned. This application Jun. 12, 1991, Ser. No. 715,042

Claims priority, application Japan, Jul. 8, 1988, 63-170081

Int. Cl.[5] D21H *21/32, 23/04*

U.S. Cl. 162—135 **8 Claims**

1. A process for treating paper which comprises adding to paper from 1 to 10% by weight of hypophosphorous acid or its salt based on the paper in terms of dry matter in the paper by spraying onto said paper said hypophosphorous acid or its salt after papermaking to provide a treated paper containing an effective amount of said hypophosphorous acid or its salt to prevent discoloration of the paper when exposed to light.

5,181,989

REACTOR FOR BLEACHING HIGH CONSISTENCY PULP WITH OZONE

David E. White, Pennington; Michael A. Pikulin, Bound Brook; Thomas P. Gandek, Trenton, all of N.J., and William H. Friend, Savannah, Ga., assignors to Union Camp Patent Holdings, Inc., Wayne, N.J.

Filed Oct. 26, 1990, Ser. No. 604,849

Int. Cl.[5] D21C *7/00, 9/153*

U.S. Cl. 162—241 **29 Claims**

1. A high consistency pulp/ozone bleaching reactor apparatus for ozone bleaching of high consistency pulp particles having a consistency of above 20%, a first GE brightness, and a particle size sufficient to facilitate substantially complete penetration of a majority of the pulp particles by ozone when exposed thereto, to a second, higher GE brightness, said apparatus comprising:

a shell having a pulp inlet and a pulp outlet;

means for introducing high consistency pulp particles into the shell;

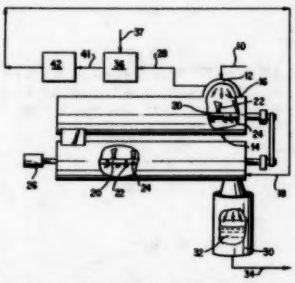
a source of ozone containing gaseous bleaching agent;

means for introducing a flow of said ozone containing gaseous bleaching agent into the shell to provide an ozone containing gas phase within said shell;

a shaft extending through the shell along a longitudinal axis thereof and having a first end adjacent to the pulp inlet and a second end adjacent to the pulp outlet; and

a plurality of paddle blades extending radially from the shaft and being sized, positioned and oriented in a predetermined pattern defining a pitch to simultaneously provide

(a) means for exposing substantially all surfaces of a majority of the high consistency pulp particles to the gaseous bleaching agent to allow approximately equal access of the ozone to all pulp particles by lifting, displacing and tossing the pulp particles in a radial direction to



disperse the particles along the periphery of the shell and suspend pulp particles in the gas phase,

(b) means for advancing the dispersed and exposed high consistency pulp particles through the shell in an axial direction in a plug-flow like manner with a dispersion index of about 4.8 or less, and

(c) means for advancing the high consistency pulp particles though the shell in the axial direction with a predetermined pulp residence time sufficient to maintain a fill level of at least about 10% of the dispersed pulp particles in said shell;

whereby substantially uniform bleaching by reaction with said ozone throughout the majority of the pulp particles is achieved to form a bleached pulp having the second GE brightness.

5,181,990

PYROLYSIS FURNACE FOR OLEFIN PRODUCTION

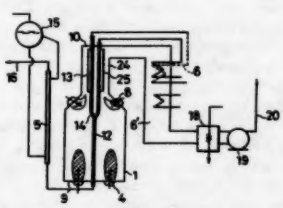
Kenji Arisaki, Kawasaki, and Hisashi Morimoto, Kure, both of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Japan

Continuation of Ser. No. 449,349, Dec. 13, 1989, abandoned, which is a continuation of Ser. No. 3,390, Jan. 15, 1987, abandoned. This application May 16, 1991, Ser. No. 702,130

Claims priority, application Japan, Jan. 16, 1986, 61-4421[U]

Int. Cl.[5] C10G *9/18*

U.S. Cl. 196—110 **14 Claims**



1. A pyrolysis apparatus for cracking hydrocarbons to form olefins comprising:

a furnace having an upper part and a lower part, said upper part being narrower than said lower part;

a pair of inlet tubes supported in said upper part and extend-

ing generally vertically within said furnace from respective inlets for an unreacted hydrocarbon feed;

an outlet tube joined to said inlet tubes and supported in said lower part and having a larger diameter than either of said inlet tubes and extending generally vertically within said furnace to an outlet for cracked hydrocarbons;

said inlet and outlet tubes defining a hydrocarbon flow path extending from said inlets through said inlet tubes and, after confluence, through said outlet tube to said outlet, the hydrocarbon flow path extending in a single direction without returning toward said inlets; and

heating means controlled to provided a predetermined temperature profile in the hydrocarbons flowing through the tubes.

5,181,991

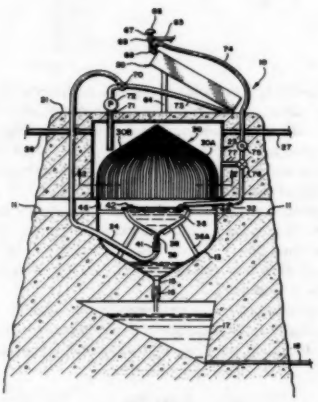
SOLAR WATER PURIFICATION DEVICE

David Deutsch, 1013 E. Bellevue Rd., Atwater, Calif. 95301

Filed Jun. 13, 1991, Ser. No. 714,599

Int. Cl.[5] B01D *3/02*; C02F *1/14*

U.S. Cl. 202—176 **11 Claims**



1. A solar water purification system comprising a domed upper structure and a distillate collecting tank means positioned below said domed upper structure; said domed upper structure operatively connected to said distillate collecting tank means at a horizontal midpoint to provide an interior for said water purification system; load tank means operably positioned in said distillate collecting means; a first preheater means encapsulating said domed upper structure; load supply means supplying fresh load to said first preheater means, and distillate storage means positioned below said distillate collecting means for receiving purified distillate therefrom; all of said aforementioned structure positioned below the earth's surface to enhance the condensation of vapors within said domed upper structure; access means for providing access to said interior of said water purification system; said load supply means including conduit transfer means interconnecting said first preheater means and said load tank means; second solar preheater means including conduit and control means for selectively receiving load from either said first preheater means or from said load tank means for further increasing the temperature of said load prior to its discharge into said load tank means whereby preheated load evaporates therein, rises as vapors and condenses upon the interior surface of said domed upper structure and smoothly flows by gravity down said interior surface into said distillate collecting tank means.

5,181,992

SEPARATION OF ISOMERS, E. G., PHENETHYL BROMIDE FROM 1-PHENYL-1-BROMOETHANE

Raymond Commandeur, Vizille; Gilles Drivon, Saint-Martin en Haut, and Elie Ghenassia, Grenoble, all of France, assignors to Atochem, Puteaux, France

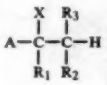
Filed Jun. 13, 1990, Ser. No. 537,926

Claims priority, application France, Jun. 13, 1989, 89 07800

Int. Cl.[5] B01D *3/34*

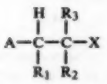
U.S. Cl. 203—29 **7 Claims**

1. A process for the separation of two isomers of the formulae (I) and (II):



(I)

and



(II)

in which A is an aryl radical or a substituted aryl radical; X is a halogen atom; R_1 is X_1, hydrogen or an alkyl radical; R_2 is X_2, H or an alkyl radical; X_1 and X_2 are also halogen atoms; and R_3 is hydrogen or an alkyl radical, comprising:

(a) condensing the isomer (I) with an aromatic compound bearing at least one aryl hydrogen, in the presence of a catalytically effective amount of a Friedel-Crafts catalyst; and

(b) separating the product of condensation of step (a) from the isomer (II).

5,181,993

PROCESS FOR CONVERTING FERROUS IONS TO FERRIC IONS

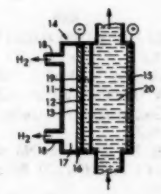
Nagakazu Furuya, 4-3-31, Ohte 2-Chome, Kofu-shi, Yamanashi, Japan, assignor to Nagakazu Furuya and Tanaka Kikinzoku Kogyo K.K., Japan

Continuation-in-part of Ser. No. 410,582, Sep. 21, 1989, Pat. No. 5,071,516. This application Sep. 10, 1991, Ser. No. 757,477

Claims priority, application Japan, Sep. 22, 1988, 63-238595; Sep. 28, 1988, 63-243675; May 13, 1989, 1-120133

Int. Cl.[5] C25B *1/00, 1/02*

U.S. Cl. 204—86 **5 Claims**



1. A process for converting ferrous ions to ferric ions comprising:

supplying a solution containing ferrous ions to the reaction layer side of a gas permeable membrane or electrode formed by joining a catalyst-supporting reaction layer with a gas permeable layer, the pressure of the solution containing ferrous ions being greater than that of the oxidizing gas;

supplying an oxidizing gas to the gas permeable side of the membrane, and converting the ferrous ions to ferric ions in solution.

5,181,994
PROCESS FOR THE PREPARATION OF CHROMIC ACID

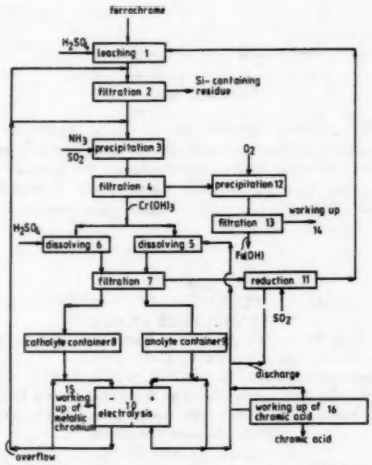
Norbert Lönhoff, Leverkusen; Ludwig Schmidt, Krefeld; Hans-Dieter Block, and Rainer Weber, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 11, 1990, Ser. No. 625,715

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1989, 3941570

Int. Cl.[5] C25B *1/22*

U.S. Cl. 204—97 6 Claims



1. A process for the production of chromic acid, comprising

a) dissolving ferrochrome in sulphuric acid, to create an aqueous solution,

b) removing undissolved constituents from said solution by filtration after cooling to about 80° C.,

c) adding to said solution a reducing agent in a quantity more than equivalent to the quantity of iron (III) and chromium (IV) present in the solution,

d) precipitating chromium (III) hydroxide from said solution by raising the pH to from about 4 to about 6 by the addition of a base while maintaining the reducing conditions in the solution wherein the base is at least one of ammonia, sodium hydroxide, sodium carbonate and an aqueous solution thereof,

e) separating the precipitated chromium hydroxide from the solution at a temperature between 50° and 90° C. while maintaining the reducing conditions,

f) working up the aqueous solution by oxidation; precipitation iron (III) as either iron hydroxide, iron (III) oxide or both,

g) forming a first aqueous solution of a portion of the separated chromium hydroxide with chromic acid, and a second aqueous solution of the remainder of the separated chromium hydroxide with an acid selected from the group consisting of chromic acid and sulfuric acid,

h) separating the solution from undissolved constituents and

i) employing said first solution as anolyte in the electrolytic production of chromic acid in an electrolytic cell divided by a membrane, and using the second solution as catholyte in the above mentioned electrolytic cell; at least one of (i) at least one of hydrogen and metallic chromium being deposited lectrolytically at the cathode, and (ii) chromium (II) ions being produced electrolytically.

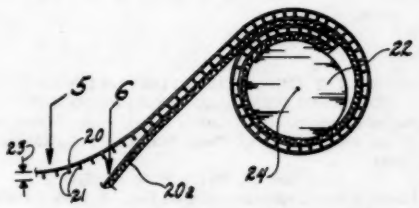
5,181,995
ELECTROCHEMICAL PROCESS AND APPARATUS FOR REDUCING OXIDANTS OF VEHICLE INTERIOR AIR

Joseph T. Kummer, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 1, 1990, Ser. No. 591,326

Int. Cl.[5] C25B *1/02, 9/00*

U.S. Cl. 204—101 21 Claims



1. An electrochemical method for selectively reducing gaseous oxidants of ozone, NO_2, or peroxy nitrate contained in the air of a vehicle interior space at ambient temperature and pressure, comprising:

(a) applying a constant current with a low voltage to an electrochemical cell comprised of a positive catalyzed electrode and a negative catalyzed electrode separated by a hydrophilic, protonic hydrogen ion conductor electrolyte therebetween containing moisture, said cell being effective to produce a reducing condition at said negative electrode by a concentration of hydrogen ions thereat; and

(b) moving said oxidant laden air, for said vehicle interior space, across said negative electrode to reduce said oxidants and form water as a byproduct.

5,181,996
ELECTROCHEMICAL GENERATION OF DINITROGEN PENTOXIDE IN NITRIC ACID

Greville E. Bagg, Waltham Abbey, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

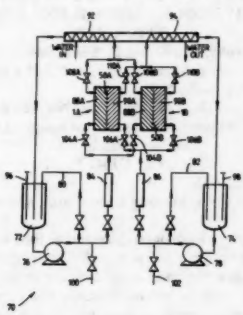
PCT No. PCT/GB89/01497, § 371 Date Jul. 23, 1991, § 102(e) Date Jul. 23, 1991, PCT Pub. No. WO90/07020, PCT Pub. Date Jun. 28, 1990

PCT Filed Dec. 14, 1989, Ser. No. 730,969

Claims priority, application United Kingdom, Dec. 16, 1988, 8829449

Int. Cl.[5] C25B *1/00*

U.S. Cl. 204—101 17 Claims



1. A method for the electrochemical generation of N_2O_5 comprising the steps of:

(a) simultaneously oxidizing an anolyte comprising a solution of N_2O_4 in nitric acid and decomposing a catholyte comprising nitric acid, in a first production stage, said anolyte and catholyte being separated by a non-ionic, semi-permeable ion exchange membrane or an anionic ion exchange membrane, and

(b) simultaneously oxidizing anolyte from said first production stage and decomposing a catholyte comprising nitric acid, in a second production stage, said anolyte and catholyte being separated by a cationic ion exchange membrane.

5,181,997

APPARATUS AND METHOD FOR CONTINUOUSLY ELECTROLYZING ALUMINUM PRODUCTS

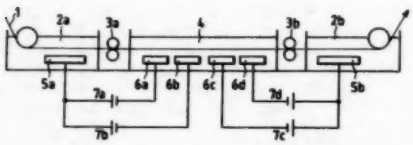
Nobuyoshi Kaneko, and Tsutomu Kakei, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 28, 1991, Ser. No. 676,516

Claims priority, application Japan, Jun. 19, 1990, 2-158795; Sep. 25, 1990, 2-251850

Int. Cl.[5] C25F *1/00, 3/00, 3/20, 7/00*

U.S. Cl. 204—129.1 **17 Claims**



9. An electrolytic treatment method for continuously electrolyzing an elongated product of aluminum or an aluminum alloy, comprising the steps of: passing said elongated aluminum product successively through a front-side power supply section, ann electrolytic section, ad a rear-side power supply electrode and said electrolytic section containing a plurality of electrodes, each of the electrolytic section and said power supply sections containing separate sections of an electrolyte in which said elongated product and said electrodes are immersed; applying a first electric current from a first power source between an electrode in said and electrolytic section at a front-side portion thereof and an electrode in said front-side power supply section; and applying a second electric current from a second power source between an electrode of said electrolytic section at a rear-side portion thereof and an electrode of said rear-side power supply section, said first and second electric currents flowing in opposite directions through said elongated product.

5,181,998

UPGRADING OF LOW VALUE HYDROCARBONS USING A HYDROGEN DONOR AND MICROWAVE RADIATION

William J. Murphy, and David H. Shaw, both of Brights Grove, Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 27, 1989, Ser. No. 457,603

The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.

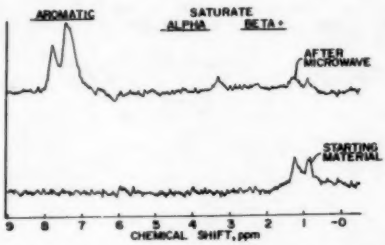
Int. Cl.[5] C10G *32/02*

U.S. Cl. 204—157.15 **21 Claims**

1. A method for upgrading a low value hydrocarbon which comprises:

(a) introducing a hydrogen donor with the proviso that if the hydrogen donor is not molecular hydrogen, then molecular hydrogen is added in an amount sufficient to prevent deactivation of the plasma initiator and a low value hydrocarbon into a reaction zone which contains at least one elongated plasma initiator capable of initiating an electric discharge in an electromagnetic field, wherein the plasma initiator is a metal selected from the group consisting of tungsten, iron or mixtures thereof, or a non-metal other than silica and the pressure in the reaction zone is at least atmospheric pressure, and

(b) subjecting the reaction zone to microwave radiation



having a frequency of at least 0.3 GHz, thereby initiating an electric discharge and upgrading at least a portion of the low value hydrocarbon, wherein the weight ratio of carbon, based on carbon in the molecules in contact with the plasma initiator, to hydrogen is maintained at less than 6:1 during upgrading.

5,181,999

CAPILLARY ELECTROPHORESIS METHOD WITH POLYMER TUBE COATING

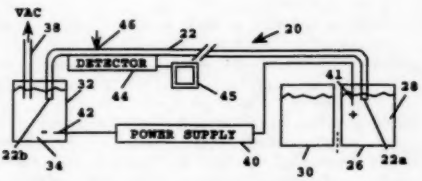
John E. Wiktorowicz, San Jose, Calif., assignor to Applied Biosystems, Inc., Foster City, Calif.

Continuation of Ser. No. 432,061, Nov. 6, 1989, Pat. No. 5,015,350. This application Apr. 8, 1991, Ser. No. 682,582

The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—180.1 **13 Claims**



1. A method of separating macromolecules in a capillary electrophoresis tube whose inner wall has charged surface chemical groups, said method comprising

drawing into a capillary tube, a solution containing a polyionic polymer having repeated subunits with charged chemical groups whose charge is opposite to that of the chemical groups of the tube's inner wall,

by said drawings, binding the polyionic polymer to the tube's inner wall by ionic, non-covalent chemical group interactions with a binding stability sufficient to retain the polymer on the tube wall during electrtoosmotic movement through the tube of an electrolyte which does not contain the polymer,

continuing said drawing until the tube's surface charged groups are substantially masked by the charge on the polymer,

immersing the ends of the tube in anodic and cathodic reservoirs containing an electrolyte solution,

introducing a sample containing macromolecules to be separated into one end of the tube,

applying an electric field across the reservoirs with a polar-

ity effective to fractionate said molecules in the sample on the basis of differential migration in the electric field.

5,182,000

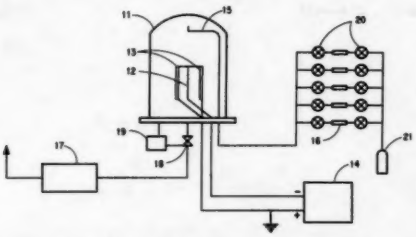
METHOD OF COATING METAL USING LOW TEMPERATURE PLASMA AND ELECTRODEPOSITION

Joseph A. Antonelli, Riverton, N.J.; Tyau-Jeen Lin, Chadds Ford, Pa.; Duck J. Yang, Wilmington, Del., and Hirotsugu Yasuda, Columbia, Mo., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1991, Ser. No. 789,485

Int. Cl.[5] C25D *13/12*

U.S. Cl. 204—181.1 **16 Claims**



1. A method of coating a metal substrate to provide corrosion protection, which method comprises the following steps:

(a) plasma pretreatment of the metal substrate with a gas plasma comprising argon, hydrogen, or a mixture thereof;

(b) plasma deposition comprising polymerization of an organic compound to form a thin film on the pretreated metal substrate, wherein the plasma deposition employs DC power and is carried out in a vacuum chamber enclosing a cathode and anode, and wherein the metal substrate is the cathode; and

(c) cathodic electrocoat application of a primer over the than polymeric film.

5,182,001

PROCESS FOR COATING SUBSTRATES BY MEANS OF A MAGNETRON CATHODE

Wolf E. Fritsche, Kleinostheim; Michael Lübbehusen, Bruchkobel; Reiner Kukla, Hanau, and Siegfried BeiBwenger, Alzenau, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Division of Ser. No. 564,363, Aug. 8, 1990, Pat. No. 5,069,772. This application Sep. 5, 1991, Ser. No. 755,293

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4018914

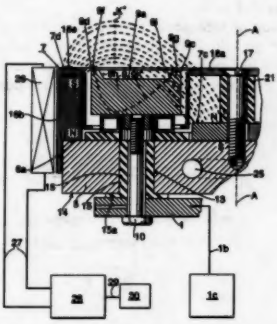
Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—192.12 **1 Claim**

1. Method for coating substrates by cathode sputtering an annularly closed target having a sputtering surface with an inner edge and an outer edge, comprising

providing a permanent magnet system having an annularly closed outer pole outside said outer edge and an annularly closed inner pole inside said inner edge, said poles being arranged to provide a closed annular tunnel of magnetic flux lines over said sputtering surface, which flux lines are parallel to said sputtering surface over an area which is closer to said outer edge than said inner edge, and

superimposing an additional magnetic field with the magnetic field of the permanent magnets by means of an annularly closed magnetic coil outside said outer pole, said additional field being varied periodically with time by an excitation current with an averaged time value greater



than zero in order to periodically shift the plane of parallel flux lines toward the inner edge of said target.

5,182,002

LINE FOR CONTINUOUSLY ANNEALING AND PICKLING STAINLESS STEEL STRIP

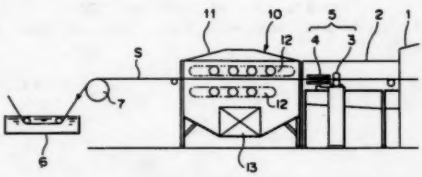
Tadashi Yamamoto, Takarazuka; Takao Seno, Minoh, and Shuichiro Shiota, Yamatokoriyama, all of Japan, assignors to Chugai Ro Company, Limited, Osako, Japan

Filed Mar. 19, 1992, Ser. No. 854,005

Claims priority, application Japan, May 1, 1991, 3-100111

Int. Cl.[5] C25F *7/00*

U.S. Cl. 204—210 **2 Claims**



1. A line for continuously annealing and pickling a stainless steel strip comprising: a drying/temperature adjusting zone, provided between a water cooling zone and a tank containing a neutral salt electrolytic solution, including hot air jetting means which controls the temperature and amount of hot air so as to dry said stainless steel strip after said stainless steel strip is cooled with water and uniformly heat the temperature of the material of said stainless steel strip.

5,182,003

STATIONARY MAGNETRON SPUTTERING CATHODE FOR A VACUUM COATING APPARATUS

Wolfram Maass, Erlensee, and Ulrich Patz, Linsengericht, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Feb. 28, 1991, Ser. No. 662,060

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1990, 4039101

Int. Cl.[5] C23C *14/35*

U.S. Cl. 204—298.23 **5 Claims**

1. Stationary magnetron sputtering cathode vacuum deposition apparatus, comprising

a substrate holder rotatable about a central axis of rotation in order to move a substrate fixed thereon on a path repre-

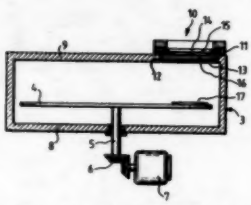
sented by a circular line traced by the center of said substrate as said holder rotates,

a target plate situated parallel to said circular path,

a yoke plate situated parallel to said target plate opposite said circular path,

a first group of substantially contiguous permanent magnets situated on said yoke plate comprising a closed loop and having a like polarity facing said target, and

a second group of substantially contiguous permanent mag-



nets situated on said yoke plate inside of said closed loop and having a like polarity facing said target which is opposite the polarity of said first group, thereby forming a closed tunnel of magnetic flux lines above said target plate and extending between said first group and said second group,

said permanent magnets in said first and second groups being arranged so that the portion of the magnetic tunnel outside of said circular path is longer than the portion of the magnetic tunnel inside of the circular path.

5,182,004

FLOW-THROUGH TYPE HYDROGEN PEROXIDE ELECTRODE

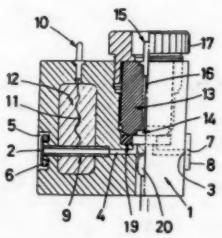
Takeshi Kohno, Miyanohigashi, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Filed Nov. 15, 1989, Ser. No. 437,346

Claims priority, application Japan, Dec. 10, 1988, 63-160475[U]

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—409 **8 Claims**



1. An improved flow-through electrode assembly to directly position a cathode and anode electrode in contact with a sample liquid comprising:

an electrode housing body having an inlet port and an outlet port with a sample liquid passageway extending therebetween;

a cylindrical hollow metal cathode electrode positioned in the electrode body and forming a portion of said sample liquid passageway, only an interior portion of the cathode electrode being in liquid contact with the sample fluid;

a disc anode electrode removably position in the electrode body at a position downstream of the cathode electrode with a surface of the anode electrode in liquid contact with the sample liquid;

resilient means for resiliently mounting the anode electrode for sealing contact with the sample liquid passageway, and means for removably pressing the anode electrode against the resilient means, including

a support member contacting the anode electrode, and

force means on the electrode body for permitting an operator to progressively exert an increasing amount of force against the support member.

5,182,005

REFERENCE ELECTRODE FOR CHEMICAL SENSORS

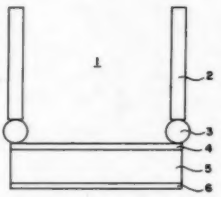
Stefan Schwiegk; Klemens Mathauer, both of Mainz; Gerhard Wegner, Mainz-Drais; Bernd F. W. Hoffmann, Rheinstetten, and Albrecht Vogel, Karlsruhe, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen

Filed May 24, 1991, Ser. No. 705,441

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1990, 4017805

Int. Cl.[5] G01N *27/26*

U.S. Cl. 204—435 **6 Claims**



1. A reference electrode for chemical sensors based on ion-selective field-effect transistors (CHEMFETs) which contain insulator/semiconductor substrates as such or coated with thin films of phthalocyaninato-polysiloxane polymers in an electrolyte/insulator/semiconductor (EIS) system, wherein the reference electrode consists essentially of an insulator/semiconductor substrate coated with polyglutamate, or an insulator/semiconductor substrate having thereon a phthaloxyaninato-polyisoloxane polymer film coated with polyglutamate.

5,182,006

ZINCATE SOLUTIONS FOR TREATMENT OF ALUMINUM AND ALUMINUM ALLOYS

Juan Haydu, Orange; Vincent Paneccasio, Jr., Madison, and Patricia A. Cacciatore, Oakville, all of Conn., assignors to Enthone-OMI Inc., West Haven, Conn.

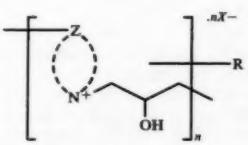
Filed Feb. 4, 1991, Ser. No. 650,149

Int. Cl.[5] C25D *5/44*; B05D *1/18*

U.S. Cl. 205—213 **13 Claims**

1. A method for depositing a smooth metal coating on an aluminum substrate comprising:

(a) applying an immersion zincate coating on the aluminum by immersing the aluminum in a zincate bath comprising an effective amount of an additive represented by the formula:



wherein:

Z represents a group of atoms necessary to complete a heterocyclic compound having a fixe or six membered ring containing at least 2 nitrogen atoms;

R is nothing or the alkyl group of an alkylating agent;

X is Cl, Br or I; and

n is >1;

(b) plating the zincated aluminum substrate using an electroless or electrolytic metal plating bath.

5,182,007

STAIN PREVENTING METHOD

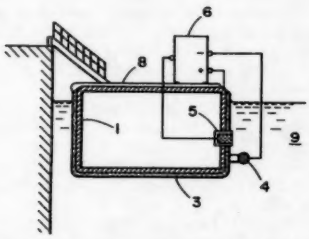
Kazo Takagi, Chiba; Shigeoki Nakamura, Nagareyama, and Chisei Murayama, Kashiwa, all of Japan, assignors to Daiki Engineering Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1991, Ser. No. 735,133

Claims priority, application Japan, Jul. 23, 1990, 2-194257

Int. Cl.[5] C23F *13/00*

U.S. Cl. 204—147 **4 Claims**



1. A method for preventing stains due to adhesion of marine organisms to an article contacting with sea water, comprising the steps of: performing direct lining of a conductive sheet made of a conductive substance on a stain prevention-requiring portion of said article subjected to stain prevention; arranging an electrode member and a reference electrode in sea water so as not to contact with the conductive sheet; applying a direct electric current using the conductive sheet as an anode and the electrode member as a cathode and utilizing said article subjected to stain prevention as an electric current feeding member; allowing current to flow while measuring a potential difference between the reference electrode and the anode; and controlling the surface potential of the conductive sheet to be in a range of +0.5 to 1.5 V vs SCE so as to give electric shock to microorganisms which contact with the conductive sheet and thus prevent adhesion of microorganisms on said article.

5,182,008

FILTRATION ASSEMBLY

Richard J. Shelstad, 37352 S. Black Foot Dr., Tucson, Ariz. 85737

Filed Apr. 24, 1991, Ser. No. 690,599

Int. Cl.[5] B01D *21/30*

U.S. Cl. 210—139 **15 Claims**

1. A filtration apparatus for removing solid particles from a liquid and collecting a low moisture solid residue comprising

a drum supported for rotation about an axis and including an interior, a top portion and a bottom portion and a filter member defining at least part of a side wall extending between said top portion and said bottom portion and having inner and outer surfaces;

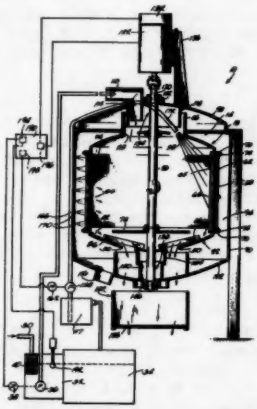
transfer means for introducing a liquid containing solid particles into the interior of said drum;

first control means operable to commence and terminate operation of said transfer means and thereby respectively commence and terminate introduction of said liquid into said drum, said first control means including means for commencing operation of said transfer means at predetermined time intervals and terminating operation of said transfer means in response to expiration of a predetermined time period thereafter;

drive means for rotating said drum about said axis at a sufficient speed to generate centrifugal forces for forcing said liquid radially outwardly toward said filter member and cause a flow of liquid filtrate through said filter member and a relatively dry layer of solid particles to collect on the inner surface of said filter member;

brake means selectively operable to stop rotation of said drum after operation of said drive means is terminated;

second control means operable to commence operation of said drive means, to terminate operation of said drive means in response to expiration of a predetermined time period after operation of said transfer means has been terminated commence operation of said brake means at approximately the same time as the operation of said drive means is terminated;



spray means for spraying a pressurized fluid onto the outer surface of said filter member to dislodge solid particles collected on the inner surface of said filter member;

third control means operable to commence operation of said spray means at a predetermined time relative to terminating operation of said drive means and to terminate operation of said spray means in response to expiration of a predetermined time period after commencement of the operation of said spray means; and

means for removing dislodged solid particles from the bottom portion of said drum.

5,182,009

PLATING PROCESS

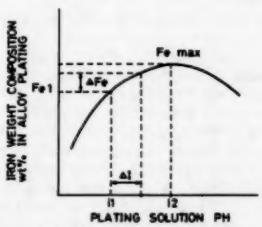
Sigeyuki Matumoto, Kanagawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 23, 1991, Ser. No. 644,824

Claims priority, application Japan, Jan. 23, 1990, 2-13080; Aug. 8, 1990, 2-211259

Int. Cl.[5] C25D *5/16, 5/00*

U.S. Cl. 205—238 **6 Claims**



1. A method of plating a metal comprising the following steps: contacting said metal with a plating solution said plating

solution having a pH and at least two metal ions, each metal ion having a concentration and said metal ions comprising at least one pH dependent metal ion, said pH dependent metal ion having a range of pH at which said pH dependent metal ion plates out of solution at a higher rate as the pH increases, and a range of concentration at which said pH dependent metal ion plates out of solution at a decreasing rate as the pH dependent metal ion concentration decreases; said pH and said pH dependent metal ion concentration selected such that during the period in which said metal is exposed to plating conditions, said plating solution has a range of pH, and a range of concentration of pH dependent metal ion at which such changes in pH and changes in pH dependent metal ion concentration cooperate to plate said pH dependent metal ion at a uniform rate; and imposing plating conditions for a period of time during which said pH and pH dependent metal ion concentration are within said range of pH and said range of concentration.

5,182,010

MESOPHASE PITCH FOR USE IN THE MAKING OF CARBON MATERIALS

Isao Mochida, Fukuoka; Yukio Sakai, and Hiroyuki Ohtsuka, both of Okayama, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

Continuation-in-part of Ser. No. 618,893, Nov. 28, 1990, abandoned. This application Jul. 26, 1991, Ser. No. 736,561

Claims priority, application Japan, Nov. 29, 1989, 1-309482; Oct. 12, 1990, 2-272300

Int. Cl.[5] C10C *3/00*

U.S. Cl. 208—44 **8 Claims**

1. Mesophase pitch for use in the production of carbon materials that has an average molecular weight of at least about 1,000 and the maximum molecular weight of up to about 15,000, that contains about 12 to 20 mole % of molecules having an average molecular weight of less than about 600, about 55 to 70 mole % of molecules having an average molecular weight of from about 600 to 1,500 and about 20 to 30 mole % of molecules having an average molecular weight of higher than about 1,500, that has a hydrogen-to-carbon atomic ratio of about 0.5 to 1.0 and an aromatic carbon ratio of at least about 0.7 with the methylic carbon content being at least about 4% of the total carbon atoms, and that has at least about 90% of an optically anisotropic phase.

5,182,011

PROCESS FOR PREPARING PITCHES

Masatoshi Tsuchitani; Makoto Tamura; Kiyotaka Suzuki; Shuji Okada; Ryoichi Nakajima, all of Ichihara, and Sakae Naito, Chiba, all of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 504,723, Apr. 3, 1990, Pat. No. 5,091,072, which is a continuation of Ser. No. 202,126, Jun. 2, 1988, abandoned. This application Nov. 21, 1990, Ser. No. 616,836

Claims priority, application Japan, Jun. 18, 1987, 62-152064; Nov. 13, 1987, 62-287173

Int. Cl.[5] C10C *1/18, 1/00*

U.S. Cl. 208—39 **29 Claims**

1. A process for preparing a mesophase pitch for the production of high-performance carbon fibers which comprises

A. a first continuous step of heat-treating a combined feed consisting of

a. a heavy oil or pitch of coal or petroleum origin which is substantially free from a material insoluble in a monocyclic aromatic hydrocarbon solvent, and

b. the component substantially soluble in the monocyclic aromatic hydrocarbon solvent which is recycled from the fourth continuous step hereinafter described, in a tubular heater under an increased pressure at a temperature of 400°-600° C., thus producing 3-50 wt % of xylene-insoluble component in the heat-treated material without substantially producing a quinoline-insoluble component,

B. a second continuous step of distilling or flashing said heat-treated material obtained in the first step at a temperature below 350° C. under normal pressure, or at equivalent conditions, to remove a portion of light fractions, thus obtaining a thermal-cracked heavy component,

C. a third continuous step of adding to said thermal-cracked heavy component 1-5 times by weight of a monocyclic aromatic hydrocarbon solvent or other solvent having the same degree of dissolving ability with the monocyclic aromatic hydrocarbon solvent and separating and collecting an insoluble component to obtain a high-molecular-weight bituminous material,

D. a fourth continuous step of removing the solvent from the mother liquor which has been obtained from the mixture of the solvent and the thermal-cracked heavy component by removing the insoluble component contained therein in the third step, thus obtaining a component substantially soluble in said monocyclic aromatic hydrocarbon solvent, recycling whole or a portion of said component substantially soluble in said monocyclic aromatic hydrocarbon solvent to the first step,

E. a fifth step of hydrogenating said high-molecular-weight bituminous material obtained in said third step by heat-treating the same in the presence of a hydrogen-donating solvent and removing said hydrogen-donating solvent to obtain a substantially optically isotropic hydrogenating pitch, and

F. a sixth step of heat-treating said substantially isotropic hydrogenated pitch under the conditions of a reduced or normal pressure and a temperature of 350°-500° C. while flowing an inert gas or a super-heated vapor, thereby converting said hydrogenated pitch into a mesophase pitch.

5,182,012

CRYSTALLINE SILICATE CATALYST AND PROCESSES USING THE CATALYST

Stephen J. Miller, San Francisco, and Bernie F. Mulaskey, Fairfax, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 496,119, Mar. 19, 1990, Pat. No. 5,052,561, which is a continuation of Ser. No. 396,816, Aug. 22, 1989, abandoned, which is a continuation of Ser. No. 97,789, Sep. 16, 1987, abandoned. This application Apr. 1, 1991, Ser. No. 678,678

The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.

Int. Cl.[5] C10G *35/06*

U.S. Cl. 208—137 **32 Claims**

1. A process for reforming a hydrocarbon feedstream to maintain production of aromatic hydrocarbons over a prolonged period of operation comprising,

contacting a hydrocarbon feed having less than about 1.0 ppm sulfur at a pressure of less than 100 psig and at a temperature between about 599° and about 1058° F. and a molar ratio of added hydrogen to said hydrocarbon feedstream of not greater than about 1.0 with a catalyst comprising platinum, an alkali or alkaline earth metal, and an intermediate pore size crystalline silicate which has at least about 80% crystallites and a silica to alumina molar ratio of at least about 40:1, and in which the size of at least about 80 wt.% of said crystallites is less than 5 microns.

5,182,013

NAPHTHENIC ACID CORROSION INHIBITORS

Philip R. Petersen, Houston; Frederick P. Robbins, III, Deer Park, and William G. Winston, Houston, all of Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 21, 1990, Ser. No. 631,422

Int. Cl.[5] C10G *7/10*

U.S. Cl. 208—348 **7 Claims**

1. A method of inhibiting naphthenic acid corrosion of crude oil in a crude oil distillation unit carried out at a temperature

above 400 degrees F., said method comprising introducing into the oil an effective amount of an organic polysulfide to inhibit naphthenic acid corrosion, said polysulfide having the following formula:

$$R—(S)x—R'$$

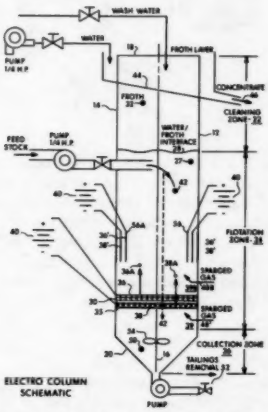
where: R and R' are each alkyl groups having from 6 to 30 carbon atoms, or a cycloalkyl group having from 6 to 30 carbon atoms, or an aromatic group, and may be the same or different; and x ranges from 2 to 6.

5,182,014

METHOD AND APPARATUS FOR INCREASING FLOTATION CELL RECOVERY AND GRADE OF COMPLEX COPPER-CONTAINING ORES

Laurence R. Goodman, 299 Bear Dr., Golden Gate Park Estates, Golden, Colo. 80403

Filed May 30, 1990, Ser. No. 530,970
Int. Cl.[5] B03D *1/02, 1/06, 1/16, 1/24*
U.S. Cl. 209—164 **13 Claims**



1. A flotation process for separating a first metal-bearing mineral constituent from a second metal-bearing mineral constituent which are incorporated in an ore comprised of at least a first metal-bearing mineral portion, a second metal-bearing mineral portion and a remainder portion, said process comprising:

(1) grinding the ore prior to introduction into a rougher, flotation tank;

(2) partially filling said rougher flotation tank with a liquid to define a collection zone occupied by said liquid and a cleaning zone, located above said liquid which is to be occupied by a froth produced by a flotation process carried out in the rougher, flotation tank and wherein said liquid is capable of decomposing under electrolysis to form a first group of gas bubbles which have average diameters smaller than the average diameters of a second group of gas bubbles introduced into said rougher, flotation tank by sparging;

(3) introducing the ore into the rougher, flotation tank at a first level which is located above a second level where an electrolysis device is positioned in the rougher, flotation tank;

(4) operating an electrolysis device at the second level of the rougher, flotation tank in order to decompose the liquid and thereby form a first group of gas bubbles which rise through a substantial part of the depth of the liquid which defines the collection zone of the rougher, flotation tank;

(5) sparging a second group of gas bubbles into the liquid of the rougher, flotation tank at a third level which lies below the first level at which the ore is introduced into said rougher, flotation tank;

(6) allowing the ore to descend under the influence of gravity to a fourth level located in the bottom of the rougher, flotation tank such that during said descent the ore is exposed to both the first group of gas bubbles produced by the electrolysis of the liquid and the second group of gas bubbles produced by the sparging in order that a first metal-bearing mineral portion and a second metal-bearing mineral portion of the ore become associated with the rising gas bubbles and thereby produce a metal-bearing mineral froth in the cleaning zone of the rougher, flotation tank while a remainder portion of the ore descends to the fourth level in said rougher, flotation tank;

(7) collecting the remainder portion from the bottom of the rougher, flotation tank;

(8) collecting the metal-bearing mineral froth from the collection zone of the rougher, flotation tank and concentrating said froth to form a first stage, metal-bearing mineral concentrate and transferring said concentrate to a rougher, cleaner flotation tank;

(9) partially filling a rougher, cleaner flotation tank with a liquid to define a collection zone occupied by said liquid and a cleaning zone located above said liquid which is to be occupied by a metal-bearing material froth produced by a flotation process in which gas bubbles are introduced into said rougher, cleaner tank at a third level by sparging and wherein said liquid is capable of decomposing under electrolysis to form gas bubbles which have average diameters smaller than the average diameters of gas bubbles introduced into said rougher, cleaner flotation tank by sparging;

(10) introducing the first stage, metal-bearing mineral concentrate from the rougher flotation tank into the rougher, cleaner flotation tank at a first level within the rougher, cleaner flotation tank which is located above a second level where an electrolysis device is located in the rougher, cleaner flotation tank and above a third level where a gas is sparged into said rougher, cleaner flotation tank;

(11) operating an electrolysis device at the second level of the rougher, cleaner flotation tank to decompose the liquid therein and form a first group of gas bubbles which rise through a substantial part of the depth of the liquid which defines the collection zone of the rougher, cleaner flotation tank;

(12) sparging a gas into the rougher, cleaner flotation tank to produce gas bubbles in the liquid at a level of the rougher, cleaner flotation tank which lies below the first level at which the first stage metal-bearing mineral concentrate from the rougher flotation tank is introduced into the rougher, cleaner flotation tank;

(13) allowing the first stage, metal-bearing mineral concentrate to descend under the influence of gravity to a fourth level located in the bottom of the rougher, cleaner flotation tank such that during said descent the first stage, metal-bearing mineral concentrate is exposed to gas bubbles produced by the electrolysis device and by the sparging gas in order that a first portion of the first stage, metal-bearing mineral concentrate becomes associated with the rising gas bubbles to produce a metal-bearing mineral froth in the cleaning zone of the rougher, cleaner tank while a remainder portion of the first stage, metal-bearing mineral concentrate descends to the fourth level of the rougher, cleaner flotation tank;

(14) collecting the remainder portion of the first stage, metal-bearing mineral bearing mineral concentrate from the bottom of the rougher, cleaner flotation tank;

(15) collecting the mineral-containing froth from the collection zone of the rougher, cleaner flotation tank and concentrating said froth to form a second stage, metal-bearing mineral concentrate and transferring said concentrate to a differential flotation tank;

(16) partially filling a differential flotation tank with a liquid to define a collection zone occupied by said liquid and a cleaning zone located above said liquid which is to be occupied by a froth produced by a flotation process carried out in said differential flotation tank and wherein said liquid is capable of decomposing under electrolysis to form gas bubbles which have average diameters smaller than the average diameters of gas bubbles introduced into said differential flotation tank by sparging;

(17) introducing into the liquid of said differential flotation tank a flotation agent capable of selectively floating a first metal-bearing mineral constituent of the second stage metal-bearing mineral concentrate;

(18) introducing into said liquid of said differential flotation tank a depressant agent capable of selectively depressing a second metal-bearing material constituent of the second stage, metal-bearing mineral concentrate;

(19) operating an electrolysis device at the second level of the rougher, cleaner flotation tank to decompose the liquid in order to form a first group of gas bubbles which rise through a substantial part of the depth of the liquid which defines the collection zone of the differential flotation tank;

(20) introducing the second stage, metal-bearing mineral concentrate into the differential flotation tank at a first level within the differential flotation tank which is located above a second level where an electrolysis device is positioned in said differential flotation tank;

(21) sparging gas bubbles into the differential flotation, tank at a third level which lies below the first level at which the second stage, metal-bearing mineral concentrate is introduced into the differential flotation tank;

(22) allowing the second stage, metal-bearing mineral concentrate to descend under the influence of gravity to a fourth level located in the bottom of the differential flotation tank such that during said descent a first metal-bearing mineral constituent of the second stage, metal-bearing mineral concentrate becomes associated with the flotation agent and is exposed to the gas bubbles in order that a first metal bearing mineral constituent becomes associated with the rising gas bubbles and thereby producing a third metal-bearing mineral froth in the cleaning zone of the differential flotation tank while a second metal-bearing mineral constituent of the second stage, metal-bearing mineral concentrate becomes associated with the depressant agent and descends to the fourth level in the differential flotation tank;

(23) collecting the third metal bearing-mineral froth from the collection zone of said differential flotation tank;

(24) collecting the second metal-bearing mineral constituent from the bottom of the differential flotation tank to produce a concentrate of said second metal-bearing mineral constituent; and

(25) smelting the second metal-bearing mineral constituent to obtain a metal contained in said second metal-bearing mineral constituent.

5,182,015

PLASTIC OIL FILTER ASSEMBLY

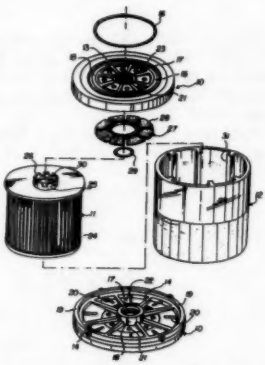
Albert Lee, Timonium, Md., assignor to Alberee Ltd., Inc., Baltimore, Md.

Filed Jul. 2, 1991, Ser. No. 724,799
Int. Cl.[5] B01D *27/08*
U.S. Cl. 210—94 **8 Claims**

1. A plastic oil filter assembly for use in the lubricating systems of an internal combustion engine, comprising:

a closure plate having an inside surface and an outside surface, said closure plate including a center opening, a plurality of raised supporting fins radially extending from said center opening on said inside surface, a groove on said outside surface, a ring positioned in said groove, and a plurality of oil inlet apertures penetrating through said closure plate;

an oil filter member having a filter and including a cylindrical saw-toothed coupling having a plurality of teeth extending axially from an edge thereof, wherein a respective said saw-tooth engages with a respective space defined between adjacent ones of said plurality of raised supporting fins in the closure plate, said saw-toothed coupling surrounding said center opening of the closure plate and having a cylindrical interior passage extending axially therethrough to provide communication between an interior of said filter and said center opening;



a flat radially slit check valve surrounding said saw tooth coupling and positioned between said closure plate and said oil filter member to cover said inlet apertures; and,

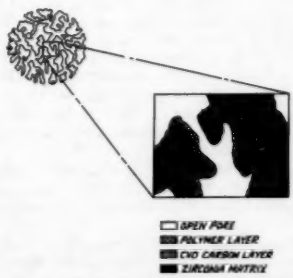
a transparent exterior enclosure secured to said closure plate and enclosing said oil filter member, said transparent exterior enclosure including a plurality of vertically extending raised portions disposed on an interior thereof for supporting said oil filter member.

5,182,016

POLYMER-COATED CARBON-CLAD INORGANIC OXIDE PARTICLES

Eric F. Funkenbusch, St. Paul; Peter W. Carr, Minneapolis; Douglas A. Hahggi, and Thomas P. Weber, both of St. Paul, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 497,595, Mar. 22, 1990, abandoned. This application Sep. 18, 1991, Ser. No. 761,431
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 **31 Claims**



1. A particle comprising an inorganic oxide core, a carbon cladding on said core, and a cross-linked polymer coating on said carbon cladding, wherein said inorganic oxide core has a diameter of about 1μ to about 1 cm.

5,182,017

FILTRATE SEPARATING DEVICE WITH FLEXIBLE DEFORMABLE LIQUID AND GAS IMPERMEABLE WALL

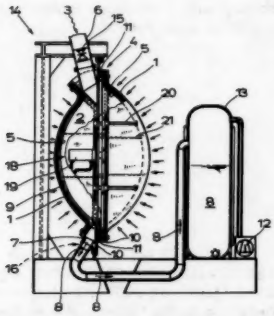
Ralph Ippendorf, von Pylsum Weg 12, 5600 Wuppertal, Fed. Rep. of Germany

Filed Jul. 17, 1991, Ser. No. 731,092

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1990, 4022960

Int. Cl.[5] B01D *25/12*

U.S. Cl. 210—225 20 Claims



1. Filtrate separating device comprising a pair of walls defining a receiving space for sludge to be filtered, a frame connecting and sealing said walls, at least one filter mat placed on a respective wall in the receiving space with a filtrate space being disposed therebetween, a sludge intake connected to said receiving space and a filtrate drain connected to the filtrate space between each wall and filter mat; wherein said walls are displaceable away from each other for the removal of a dry filter cake, freed from filtrate by opening of the frame; wherein at least one of the walls is formed of a flexibly deformable liquid and gas impermeable material; wherein spacers are located between each wall and filter mat in a manner enabling them to follow movements of the respective wall and filter mat; wherein said frame comprises a respective rigid frame part connected to each wall, with the frame parts being connected to one another in a sealing manner by a sealing arrangement; and wherein the filtrate drain is at least indirectly connected to a vacuum pump in a manner enabling a partial vacuum to be drawn in each filtrate space.

5,182,018

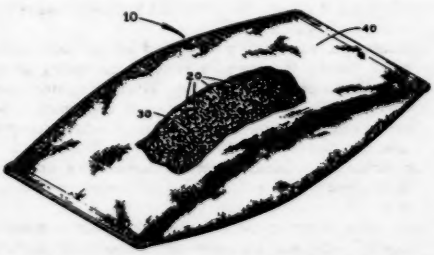
PROTEIN ABSORBING AQUARIUM FILTER ELEMENT AND METHOD

Mark A. Langston, 4201 Neshaminy Blvd. #108-240, Bensalem, Pa. 19020

Filed Mar. 25, 1992, Ser. No. 857,271

Int. Cl.[5] B01D *24/02, 27/02*

U.S. Cl. 210—282 8 Claims



1. A filter for absorbing proteins in an aqueous solution which is circulated and constrained to flow through the filter, comprising:

a plurality of macroporous protein-absorbing particles formed of a polymeric material,

sand for slowing the rate of flow of said aqueous solution sufficiently to permit said macroporous protein-absorbing particles to absorb said proteins,

a water-permeable envelope for containing said macroporous protein absorbing particles and said sand.

5,182,019

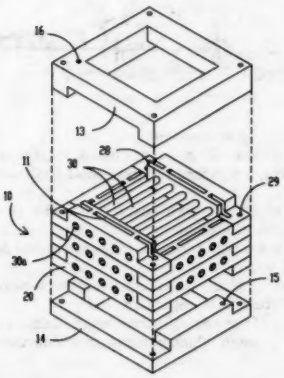
CARTRIDGE OF HYBRID FRAMELESS ARRAYS OF HOLLOW FIBER MEMBRANES AND MODULE CONTAINING AN ASSEMBLY OF CARTRIDGES

Pierre L. Cote, Hamilton; Roger P. Maurion, Burlington; Christopher J. Lipski, Burlington, and Steven K. Pedersen, Burlington, all of Canada, assignors to Zenon Environmental Inc., Burlington, Canada

Continuation-in-part of Ser. No. 569,405, Aug. 17, 1990, Pat. No. 5,104,535. This application Mar. 3, 1992, Ser. No. 845,168

Int. Cl.[5] B01D *63/04*

U.S. Cl. 210—321.8 31 Claims



1. A module for use as a membrane device, comprising, a shell having two ends;

a pair of end closures with fluid couplings removably affixed to each of said ends of said shell;

at least one unitary cartridge disposed longitudinally within said shell, said cartridge comprising plural frameless arrays of hollow fibers of selectively permeable material held near their opposite terminal portions in a pair of mirror-image split-clip headers, each split-clip header in one array being laminated to another in a successive array so as to define a fluid-tight axial conduit having open ends through which a feedstream is flowed transversely over said fibers into a concentrate zone, the bores of said fibers being in open fluid communication with a permeate zone in said shell;

each split-clip header having

(i) lateral grooves which provide a through-passage in the plane of the fibers, said grooves being adapted snugly to embrace terminal end portions of each fiber so that fibers of an array lie in parallel spaced-apart relationship in a plane substantially orthogonal to the direction of flow of said feedstream, and the fibers of one array lie transversely to those of another array, and,

(ii) a potting channel traversing at least the width of an array of fibers, the potting channel of one split-clip header in open communication with that of a contiguous split-clip header;

an annular shell of potting resin integrally formed within

said potting channels of said split-clip headers, to pot said fibers near their ends;

means for feeding said feedstream to said shell so that said feedstream flows over said hollow fibers under a sufficient driving force to effect the separation desired and yield a permeate, and separately, a concentrate;

means to remove said permeate from said permeate zone; and,

means to remove said concentrate from said concentrate zone.

5,182,020

CENTRIFUGE SEPARATING SYSTEMS

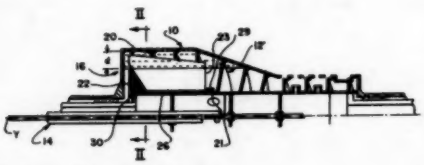
Geoffrey L. Grimwood, Holmfirth, England, assignor to Thomas Broadbent & Sons Limited, Huddersfield, England

Filed Jun. 14, 1991, Ser. No. 715,506

Claims priority, application United Kingdom, Jun. 18, 1990, 9013371

Int. Cl.[5] B04B *1/20*

U.S. Cl. 210—512.1 **15 Claims**



1. A centrifuge comprising:

a bowl rotatable about a longitudinal rotational axis;

an inlet adapted to feed into said bowl a mixture to be separated;

a helical scroll conveyor adapted to rotate about said rotational axis of the bowl at a different speed from that said bowl, in order to scroll particles to a solids discharge end of said bowl;

a plurality of plates of different lengths which extend into said mixture to be separated; and

a plurality of passages of varied length defined between said plates, through which particles in said mixture can travel.

5,182,021

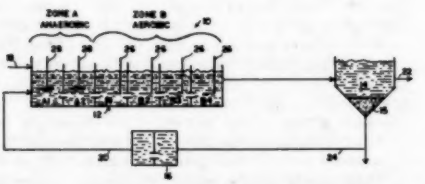
BIOLOGICAL PROCESS FOR ENHANCED REMOVAL OF AMMONIA, NITRITE, NITRATE, AND PHOSPHATE FROM WASTEWATER

Marshall L. Spector, Emmaus, Pa., assignor to Lehigh University, Bethlehem, Pa.

Filed Dec. 16, 1991, Ser. No. 808,091

Int. Cl.[5] C02F *3/30*

U.S. Cl. 210—605 **17 Claims**



1. An activated sludge treatment process for removing nitrogen and phosphate from wastewater, comprising:

(a) mixing wastewater influent containing BOD, ammonia and phosphate with activated sludge in an initial contact zone to provide a mixed liquor, said initial contact zone being maintained under anaerobic conditions;

(b) transferring the mixed liquor to an aerobic zone where the mixed liquor is aerated to oxidize BOD in the mixed liquor, and to convert ammonia present in the mixed liquor to NO_x, wherein the NO_x so produced is concurrently reduced to N_2 and/or N_2O;

(c) transferring the mixed liquor to a separation zone where the activated sludge is separated from the mixed liquor;

(d) passing at least a part of the activated sludge to a sludge holding zone maintained under anaerobic conditions and holding the activated sludge in the sludge holding zone for approximately 4 to 20 hours after complete denitrification of the sludge is achieved to effect the subsequent reduction of NO_x in the aerobic zone; and

(e) returning a portion of the activated sludge from the sludge holding tank to the initial contact zone for mixing with the influent wastewater.

5,182,022

DEWATERING OF CONCENTRATED AQUEOUS SOLUTIONS BY PERVAPORATION

Mordechai Pasternak, Spring Valley, and John Reale, Jr., Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 146,763, Jan. 22, 1988, abandoned. This application Jun. 19, 1991, Ser. No. 717,764

Int. Cl.[5] B01D *13/00*; **C07C** *29/76, 31/18*

U.S. Cl. 210—638 **1 Claim**

1. The method which comprises

passing a charge aqueous solution of ethylene glycol into contact at 40° C.–120° C. with, as a pervaporation membrane, (i) a perfluorinated resin membrane having the formula

$$-(CF_2CF_2)_m-\underset{\displaystyle CF_2}{\underset{|}{CF}}O(CF_2\underset{\displaystyle CF_3}{\underset{|}{CF}}O)_nCF_2CF_2SO_3^-M^+$$

wherein M is a metal, m is a number indicating the number of (CF_2CF_2) groups, and n is a number indicating the number of

$$(CF_2\underset{\displaystyle CF_3}{\underset{|}{CF}}O)$$

groups, said resin membrane bearing, as a counter ion, a metal of Groups IA, IB, IV B, V B, VI B, or VIII of the Periodic Table or a quaternary ammonium group R_4N wherein R is a lower alkyl, and each R group contains less than 6 carbon atoms;

maintaining a pressure drop across said pervaporation membrane thereby forming (i) a retentate containing an increased concentration of ethylene glycol and a decreased content of water and (ii) a permeate containing a decreased concentration of ethylene glycol and an increased concentration of water;

recovering said retentate containing increased concentration of ethylene glycol and decreased concentration of water; and

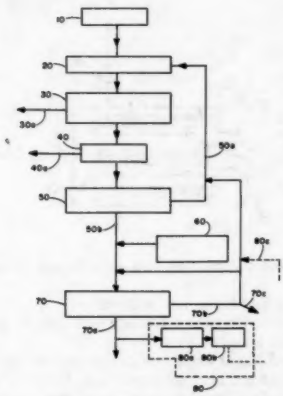
recovering said permeate containing increased concentration of water and decreased concentration of ethylene glycol.

5,182,023

PROCESS FOR REMOVING ARSENIC FROM WATER

Rodney J. O'Connor, and Mark A. O'Connor, both of College Station, Tex., assignors to Texas Romec, Inc., College Station, Tex.

Filed Oct. 17, 1991, Ser. No. 778,568
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—652 11 Claims



1. A process for treating a arsenic-contaminated aqueous waste to recover usable water comprising the steps of:

passing the arsenic-contaminated water through an ultrafilter membrane to remove solids to create an arsenic-containing aqueous filtrate

chemically treating the filtrate to produce a filtrate having a pH of from about 6 to about 8; and

subjecting the filtrate to reverse osmosis at elevated pressure of up to about 1,000 psig to yield a permeate stream having less than about 50 ppb arsenic and a reject stream containing the balance of the arsenic.

5,182,024

SEPARATION OF HYDROCARBON DEWAXING AND DEASPHALTING SOLVENTS FROM DEWAXED AND/OR DEASPHALTED OIL USING INTERFACIALLY POLYMERIZED MEMBRANE

Tan-Jen Chen, Clearwater, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 5, 1990, Ser. No. 622,449
Int. Cl.[5] B01D *61/02, 71/60*
U.S. Cl. 210—654 7 Claims

1. A method comprising separating hydrocarbon solvents used for dewaxing and/or deasphalting oils from said dewaxed and/or deasphalted oil by contacting the dewaxed and/or deasphalted oil containing hydrocarbon solvent selected from the group consisting of C_3 to C_6 alkane or alkene and mixtures thereof with an interfacially polymerized membrane on microporous ultrafiltration support baking under reverse osmosis conditions, said interfacially polymerized membrane comprising the reaction product of a multifunctional amino compound dissolved in water with a polyfunctional agent dissolved in an organic solvent.

5,182,025

METHOD OF NEUTRALIZING POLYOL CATALYSTS AND PRODUCTS

Roger G. Duranleau, Georgetown; Martin J. Plishka, and Michael Cuscurida, both of Austin, all of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Jun. 1, 1992, Ser. No. 891,070
Int. Cl.[5] B01D *15/04*
U.S. Cl. 210—681 7 Claims

5. A method for removing potassium from an alkoxylated alkyl phenol product which comprises using a partially spent insoluble cross-linked polymeric ion exchange resin catalyst possessing 60–90% of its original activity, washing the partially spent catalyst, mixing the polyol product with the partially spent catalyst in an acid/base ratio of 7/1 to 10/1, for a period of 1 to 5 hours and removing the filtrate.

5,182,026

RESINS HAVING IMPROVED EXCHANGE KINETICS

William C. Pike, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 821,524, Jan. 14, 1992, Pat. No. 5,141,965. This application May 4, 1992, Ser. No. 856,615
Int. Cl.[5] B01D *15/04;* C02F *1/28, 2/62;* C08F *26/06*
U.S. Cl. 210—688 13 Claims

1. A process having improved exchange kinetics for separating chemical species from a liquid containing the chemical species in solution, the process comprising:

(a) contacting the liquid with a resin such that the chemical species are retained thereby, the resin comprising cross-linked copolymer beads having weak-base exchange moieties substituted at haloalkylated sites which are most accessible to diffusion and hydrophilic, strong-base exchange moieties substituted at haloalkylated sites which are least accessible to diffusion; and

(b) eluting the retained chemical species from the resin with a regenerating agent.

5,182,027

PROCESS FOR TREATING AMMONIA AND NITRITE CONTAINING WATERS TO REDUCE NITROGEN OXIDE EMISSIONS THEREFROM

Darrell L. Gallup, Chino Hills, and John L. Featherstone, El Centro, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 345,177, May 1, 1989, Pat. No. 5,032,284, and a continuation-in-part of Ser. No. 226,039, Jul. 29, 1988, Pat. No. 5,061,373, and a continuation-in-part of Ser. No. 473,226, Feb. 12, 1990, Pat. No. 5,024,769. This application Jul. 31, 1990, Ser. No. 560,422
Int. Cl.[5] C02F *1/76*
U.S. Cl. 210—696 60 Claims

35. A process for use in a system in which a flow of ammonia-containing steam derived from a geothermal fluid is used to generate electric power, and which includes: (i) at least one steam turbine, (ii) at least one steam condenser downstream of the turbine in which at least some of the steam is condensed to steam condensate and from which non-condensable gases, including ammonia, are discharged, and (iii) at least one cooling tower for cooling the condensate, the cooling tower being open to the atmosphere and having associated therewith a condensate catch basin and a sump, condensate from the condenser containing nitrite and being cooled in the cooling tower for use as make-up water for the condenser, said process (1) inhibiting corrosion of metals contacted by the condensate, (2) controlling the concentration of one or more organisms selected from the group consisting of algae, fungi and bacteria growing in the cooling tower and the catch basin, and (3) controlling the emission of nitrogen dioxide from the cooling tower, said process comprising the steps of:

(a) introducing into the condensate a corrosion inhibitor

which does not substantially abate the emissions of nitrogen dioxide or inhibit the growth of organisms;

(b) substantially continuously introducing into said condensate an amount of an oxidizing agent, including at least one

wherein X is a halogen which substantially prevents the emission of nitrogen dioxide from the system, but which does not substantially inhibit the growth of said organisms; and

(c) periodically introducing into the condensate an amount of a biocide which substantially reduces the level of said organisms.

5,182,028

MONOFLUOROPHOSPHATE FOR CALCIUM CARBONATE SCALE CONTROL AND IRON AND MANGANESE STABILIZATION

Bennett P. Boffardi, Bethel Park, and Ann M. Sherbondy, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1991, Ser. No. 676,625
Int. Cl.[5] C02F *5/08*
U.S. Cl. 210—697 **12 Claims**

1. A method of inhibiting calcium carbonate scale formation in an aqueous system comprising the step of treating said system with an effective scale-inhibiting amount of a monofluorophosphate salt.

5,182,029

AQUEOUS PHOTORESIST WASTE TREATMENT BY ACID/CUPRIC CHLORIDE PRECIPITATION

Allen J. Erb, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1991, Ser. No. 800,344
Int. Cl.[5] C02F *1/52*
U.S. Cl. 210—724 **5 Claims**

1. A process for treating an aqueous waste stream containing a photoresist waste component which comprises the steps of:

adding an acid solution containing cupric chloride in a concentration of at least 1.0 gram per liter to the waste stream to lower the pH of the waste stream;

stopping the step of adding the acid solution after the photoresist waste components has separated from the aqueous waste stream as a precipitate; and

removing the precipitate from the waste stream.

5,182,030

REGENERATION OF ADSORBENTS USING ADVANCED OXIDATION

John C. Crittenden, Houghton, Mich.; Sawang Notthakun, Bangkok, Thailand; David W. Hand, Houghton, and David L. Perram, Allouez, both of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.

Filed Sep. 27, 1991, Ser. No. 766,569
Int. Cl.[5] C02F *1/28*
U.S. Cl. 210—748 **16 Claims**

1. A method of purifying fluid having organic material, said method comprising the steps of:

passing the fluid through an adsorbent having a photoreactive catalyst such that the organic material is substantially adsorbed by the adsorbent and the fluid is substantially purified; and

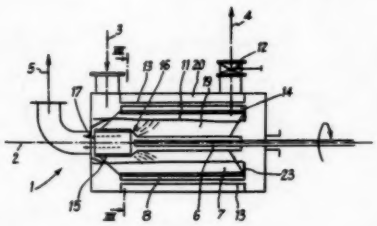
destroying the adsorbed organic material on the adsorbent by substantially only photo-energy and regenerating the adsorbent in a form substantially free of adsorbed organic material.

5,182,031

PROCESS AND DEVICE FOR DEAERATION OF LIQUIDS

Jean-Pierre Lamort, Vitry le Francois, France, assignor to E & M Lamort (Societe Anonyme), Vitry le Francois, France

Filed Jun. 20, 1990, Ser. No. 541,158
Claims priority, application France, Jun. 21, 1989, 89 08247
Int. Cl.[5] B01D *33/06*
U.S. Cl. 210—781 **29 Claims**



1. A process for degasifying a gasified liquid, comprising the steps:

introducing said liquid into a chamber;

providing centrifugal means inside said chamber for rotating said liquid about an axis;

rotating said liquid using said centrifugal means about said axis in said chamber to subject said liquid to centrifugal force to release gas from said liquid, said liquid moving to a region radially away from said axis, said released gas moving toward said axis;

providing agitating means in said region for agitating liquid, said agitating means being radially substantially outward of said centrifugations means;

simultaneously with said rotating, agitating said liquid in said region with said agitating means to aid in further release of gas;

providing a duct having one open end positioned at said rotational axis and the other end leading externally of said chamber;

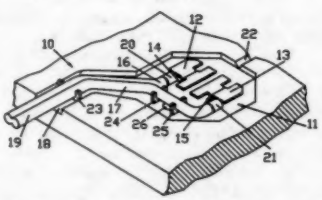
removing said released gas from said chamber through said duct.

5,182,032

APPARATUS FOR PLASTIC INJECTION OVERMOLDING

Robert G. Dickie, Newmarket, and Michael Phillips, Mississauga, both of Canada, assignors to Paige Manufacturing Company Incorporated, Newmarket, Canada

Continuation of Ser. No. 551,381, Jul. 9, 1990, abandoned. This application May 3, 1991, Ser. No. 697,504
Int. Cl.[5] B29C *45/14, 45/36, 45/42*
U.S. Cl. 249—91 **2 Claims**



1. An injection molding apparatus for electrical plugs comprising

at least two molding dies defining therebetween a parting line, a molding cavity for the injection of molten plastic, and an entry port for said molten plastic along said parting line,

at least two flat rigid positioning blades extending into said cavity from a first one of said molding dies for positioning an electrical conductor within the interior of said cavity, said electrical conductor being surrounded by deformable electrical insulation having a substantially circular cross-section and being secured therein at least while said molten plastic is injected into said cavity,

said positioning blades having at least one thin edge thereof facing the interior of said cavity contoured in a concave circular arc exceeding 180 degrees to capture said electrical insulation to releasably hold said electrical conductor in a fixed position within the interior of said cavity during said injection of said molten plastic by capturing said deformable insulation within said circular arc until the molded electrical plug is removed from said cavity,

at least one rigid electric prong having a first stabilizing portion thereof to be encapsulated in the interior of said cavity and connected to said electrical conductor, and a second portion extending out of said cavity through a slot formed in said first one of said molding dies, and

means associated with said at least one rigid electric prong for holding said electrical conductor in position in the interior of said cavity with respect to said stabilizing portion.

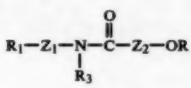
5,182,033

POLYAMIDE SALTS

Robert K. Lagerman, Dublin, Ohio, assignor to Sherex Chemical Company, Inc., Dublin, Ohio

Filed Jun. 14, 1991, Ser. No. 715,381
Int. Cl.[5] D06M *10/08*
U.S. Cl. 252—8.6 **24 Claims**

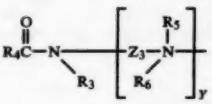
1. A compound of the formula:



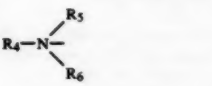
wherein

R is alkyl containing up to 22 carbon atoms, alkyl containing up to 22 carbon atoms and one or more ethylenic bonds, acyl containing 2 to 22 carbon atoms, or H;

R_1 is



X- or



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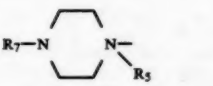

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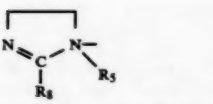


X-

Z_1, Z_2 and Z_3 are each alkylene containing 2–8 carbon atoms in the principal chain and a total of up to 15 carbon atoms;

Y is an integer from 1–3;

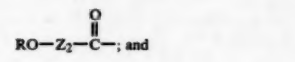
R_3 is methyl, ethyl or H;

R_4 and R_8 are each alkyl containing up to 22 carbon atoms, alkyl containing up to 22 carbon atoms and one or more ethylene bond, or $—Z_2—OR$;

R_5 is methyl, ethyl, hydroxymethyl, hydroxyethyl, or H;

R_6 is methyl, ethyl, hydroxymethyl, hydroxyethyl, or benzyl;

R_7 is



; and

X—is a salt forming anion.

5,182,034

INTERNAL MOLD RELEASE COMPOSITIONS

Louis W. Meyer, Livingston, Tex.; J. Alan Vanderhider, Fruthwilen, Switzerland, and Robert Carswell, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 570,141, Jan. 12, 1984, Pat. No. 4,876,019, which is a continuation-in-part of Ser. No. 466,826, Feb. 16, 1983, abandoned. This application Oct. 23, 1989, Ser. No. 425,762
Int. Cl.[5] C10M *105/08*; B29C *45/00*; B29B *7/00*; C08J *9/34*
U.S. Cl. 252—32.5 **18 Claims**

1. A process for preparing polymeric products which process comprises mixing an injecting into a suitable mold an "A-side" component comprising a polyisocyanate and/or polyisothiocyanate and a "B-side" component comprising a product resulting from aminating a material prepared by reacting an initiator compound having from 2 to about 8 reactive hydrogen atoms with an alkylene oxide, halogen substituted or aromatic substituted alkylene oxide or mixtures thereof, said product having an average molecular weight of from about 200 to about 6000 and containing at least one primary and/or secondary amine group per molecule or a mixture of such materials, and from about 0.5 to about 6 weight percent, based on the weight of the "B-side" component, of a Group I-A or II-A metal salt of a carboxylic acid containing at least one terminal or pendant saturated or unsaturated aliphatic hydrocarbon chain containing at least about 7 carbon atoms, wherein said "B-side" component is devoid of an organic material containing at least one carboxylic acid group, phosphorus-containing acid group or boron-containing acid group or mixture of such materials wherein said organic material contains a siloxane chain or contains at least one terminal or pendant saturated or unsaturated aliphatic hydrocarbon chain containing at least about 7 carbon atoms.

5,182,035

ANTIMICROBIAL LUBRICANT COMPOSITION CONTAINING A DIAMINE ACETATE

Bruce E. Schmidt, St. Paul, Minn., and Robert E. F. Swerts, Limburg, Belgium, assignors to Ecolab Inc., St. Paul, Minn.

Filed Jan. 16, 1991, Ser. No. 642,057
Int. Cl.[5] C10M *133/02, 173/02*
U.S. Cl. 252—34 **16 Claims**

1. An antimicrobial conveyor lubricant composition comprising:

(a) an effective lubricating and antimicrobial amount of a diamine acetate having the formula

$$((R^1)NH(R^2)NH_3)^+)CH_3COO)^-$$

or

$$((R^1)NH_2(R^2)NH_3^{++})(CH_3COO)_2^-$$

wherein R^1 is an ether group having the formula $R^{10}O(R^{11})$ wherein R^{10} is an C_{10-18} aliphatic group and R^{11} is a C_{1-5} alkyl group, and R^2 is a C_{1-5} alkylene group,

(b) an amount of an alcohol effective for enhancing the physical stability of the composition, and

(c) a balance of water.

5,182,036

BORATED HYDROXYALKYL ESTERS OF ALKYL- OR ALKENYLSUCCINIMIDE-DERIVED DITHIOCARBAMIC ACIDS AS MULTIFUNCTIONAL ASHLESS DISPERSANTS

Abraham O. M. Okorodudu, West Deptford, and Angeline B. Cardis, Florence, both of N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Filed Sep. 27, 1991, Ser. No. 766,305
Int. Cl.[5] C10M *133/44, 135/18*
U.S. Cl. 252—47.5 **19 Claims**

1. A composition comprising a major proportion of an oil of lubricating viscosity or a grease prepared therefrom and a minor multifunctional amount of an additive product comprising borated derivatives of beta-hydroxyhydrocarbyl esters of alkyl or alkenylsuccinimide-substituted dithiocarbamic acids.

5,182,037

PHOSPHORUS- AND/OR NITROGEN-CONTAINING DERIVATIVES OF SULFUR-CONTAINING COMPOUNDS, LUBRICANT, FUEL AND FUNCTIONAL FLUID COMPOSITIONS

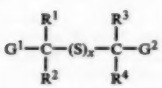
Joseph W. Pialet, Euclid; Curtis R. Scharf, Wickliffe, and Stephen A. DiBiase, Euclid, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Nov. 7, 1986, Ser. No. 928,494
Int. Cl.[5] C10L *1/18, 1/22;* **C10M** *159/12*
U.S. Cl. 252—47.5 **71 Claims**

1. A phosphorus- and/or nitrogen-containing derivative composition of sulfur-containing compounds prepared by the process comprising reacting:

(A) at least one sulfur composition selected from the group consisting of:

(A-1) compounds characterized by the structural formula


(I)

wherein

R^1, R^2, R^3 and R^4 are each independently H or hydrocarbyl groups, or either or both of

R^1 and R^3 is independently G^1 or G^2, or

R^1 and R^2, or R^3 and R^4, together are alkylene groups containing about 4 to about 7 carbon atoms;

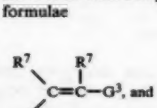
G^1 and G^2 are each independently selected from the group consisting of C(X)R, COOR, C═N, R^5—C═NR^6, $CON(R)_2$, and NO_2, wherein X is O or S, each of R and R^5 is independently H or a hydrocarbyl group, and R^6 is H or a hydrocarbyl group, or G^1 is CH_2OH;

when both G^1 and G^2 are R^5C═NR^6, the two R^6 groups together may be a hydrocarbylene group linking the two nitrogen atoms;

when G^1 is CH_2OH and G^2 is COOR, a lactone may be formed by intramolecular combination of G^1 and G^2; and

x is an integer from 1 to about 8; and

(A-2) compositions prepared by reacting sulfur and/or sulfur halides with compounds represented by the structural formulae


(II)

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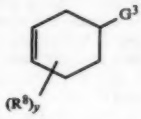
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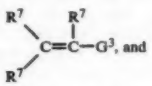
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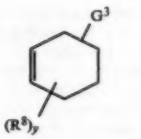

(III)

wherein

each of R^7 is independently H or a hydrocarbyl group;

R^8 is H, a hydrocarbyl group, or a hydrocarbyloxy group;

G^3 is selected from the group consisting of C(X)R, C═N, COOR, $CON(R)_2$, NO_2, or R^5C═NR^6 wherein X, R, R^5 and R^6 are as defined above; and

y is an integer from zero to 5; with

(B) a composition selected from the group consisting of a di- or trihydrocarbyl phosphite, at least one amine compound containing at least one NH or NH_2 group, and a combination of said phosphite and amine, provided, however, when G^1 and G^2 in (A-1) are —C(X)R, (B) is a di- or trihydrocarbylphosphite or a mixture of said phosphite and an amine compound containing at least one NH or NH_2 group.

5,182,038

MANNICH BASE PHENOL COUPLED MONO AND/OR BIS-SUCCINIMIDE LUBRICATING OIL ADDITIVES

Shailaja M. Shirodkar, Wappingers Falls, N.Y., and George P. Speranza, Austin, Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Apr. 24, 1991, Ser. No. 690,239
Int. Cl.[5] C10M *133/56*
U.S. Cl. 252—51.5 A **5 Claims**

1. A lubricating oil composition comprising a major portion of a lubricating oil and a minor amount of a dispersant additive prepared by the process comprising:

(a) reacting an amidoamine wi-th an alkenyl succinic acid anhydride to form a mono-and/or bis-alkenyl amidoamine-based succinimide;

(b) reacting said -mono-and/or bis-alkenyl amidoamine-based succinimide with a (C_1–C_{18}) alkyl phenol and an excess of formaldehyde to form a Mannich (C_1–C_{18}) alkyl phenol coupled mono-and/or bis-alkenyl amidoam:ine-based succinimide;

(c) combining said Mannich (C_1–C_{18}) alkyl phenol coupled mono-and/or bis-alkenyl amidoamine-based succinimide with a Mannich phenol coupled mono-and/or bis-alkenyl polyalkyleneamine-based succinim,ide in a weight ratio of about 25:75 to about 75:25 to provide the dispersant additive product; and

(d) recovering said dispersant additive product.

5,182,039

SYNERGISTIC FLUORINATED ORE FLOTATION AIDS

John C. Miller, Hawthorn Woods, and William E. Welch, Chicago Heights, both of Ill., assignors to Exxon Chemical Patents, Inc., Linden, N.J.

Filed Mar. 29, 1991, Ser. No. 677,093
Int. Cl.[5] B03D *1/01, 1/02*
U.S. Cl. 252—61 **1 Claim**

1. An amine compound having the structural formula

$$[R(NH_2R'')_nNH_{n'}]^+ {}^{Y}Y(X^-)$$

wherein

R is an alkoxyalkyl lipophile of the type

$$R'O(CH_2CH_2O)_a(CH_2\underset{|}{\overset{CH_3}{C}}HO)_b(CH_2\underset{|}{\overset{C_2H_5}{C}}HO)_cR''—$$

R′ is an alkyl radical having 3–26 carbon atoms,

R″ is an alkyl radical having 2–6 carbon atoms,

a, b, and c are integers from 0–10,

n is an integer from 0–4, and

n′ is an integer from 2–3,

X is an anion selected from the group consisting of fluoro-substituted carboxylates having 2–4 carbon atoms, and Y is an integer from 1–5 corresponding to the number of anions and degree of polyamine neutralization.

5,182,040

AZEOTROPIC AND AZEOTROPE-LIKE COMPOSITIONS OF 1,1,2,2-TETRAFLUOROETHANE

Philip L. Bartlett, Wilmington, Del.; Donald B. Bivens, Kennett Square; Brooks S. Lunger, Coatesville, both of Pa., and Akimichi Yokozeki, Greenville, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 28, 1991, Ser. No. 676,637
Int. Cl.[5] C08J *9/06;* **C09K** *3/30, 5/04;* **C11D** *7/30*
U.S. Cl. 252—67 **9 Claims**

1. An azeotrope-like composition consisting essentially of about 60–99 weight percent 1,1,2,2,-tetrafluoroethane and about 1 to 40 weight percent dimethyl ether said composition having a boiling temperature of about 0 degrees C. when the pressure is adjusted to about 28 psigand consists essentially of about 74 weight percent 1,1,2,2-tetraflu.

5,182,041

DISPERSANT - ANTI-OXIDANT ADDITIVE AND LUBRICATING OIL COMPOSITION CONTAINING SAME

Nicholas Benfarmeo, and Theodore E. Nalesnik, both of Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

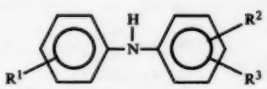
Continuation of Ser. No. 345,265, May 1, 1989, abandoned. This application Dec. 3, 1990, Ser. No. 620,688
Int. Cl.[5] C10M *133/38, 149/00*
U.S. Cl. 252—51.5 A **22 Claims**

1. An additive composition prepared by the steps comprising:

A) reacting a homopolymer or a copolymer prepared from an alpha-monoolefin having from 2 to 10 carbon atoms and optionally a polyene selected from non-conjugated dienes and trienes said homopolymer or copolymer having an average molecular weight ranging from about 300 to 3500 with at least one olefinic carboxylic acid acylating agent to form one or more acylating reaction intermediates characterized by having a carboxylic acid acylating function within their structure, and

B) reacting said reaction intermediate in (A) with an amino-aromatic polyamine compound selected from the group consisting of:

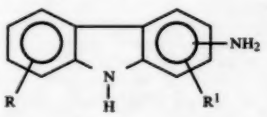
a) an N-arylphenylenediamine represented by the formula:



in which R^1 is hydrogen, R^2 is NH_2, —(NH—$(CH_2)_n$—)-$_m$—NH_2 and R^3 is alkyl, alkenyl, alkoxyl, aralkyl, alkaryl having 4 to 24 carbon atoms,

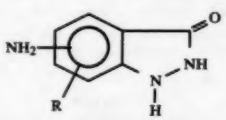
b) an aminothiazole from the group consisting of aminothiazole, aminobenzothiazole, aminobenzothiadiazole and aminoalkylthiazole,

c) an aminocarbazole represented by the formula:



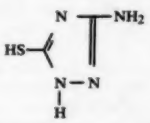
in which R and R^1 represent hydrogen or an alkyl or alkenyl, radical having from 1 to 14 carbon atoms,

d) an amino-indazolinone represented by the formula:

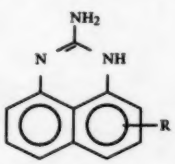


in which R is hydrogen or an alkyl radical having from 1 to 14 carbon atoms

e) an aminomercaptotriazole represented by the formula:



f) and an aminoperimidine represented by the formula:



in which R represents hydrogen or an alkyl, alkenyl, or alkoxyl radical having from 1 to 8 carbon atoms.

5,182,042

AZEOTROPE-LIKE COMPOSITIONS OF 1,1,1-TRIFLUOROHEXANE AND PERFLUOROMETHYLCYCLOHEXANE

Michael Van Der Puy, Cheektowaga, Erie, N.Y., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Oct. 21, 1991, Ser. No. 779,687
Int. Cl.[5] C11D *7/30, 7/50;* **C23G** *5/028;* **B08B** *3/00*
U.S. Cl. 252—172 **7 Claims**

1. Azeotrope-like compositions consisting essentially of from about 18 to about 61 weight percent 1,1,1-trifluorohexane and

from about 39 to about 82 weight percent perfluoromethylcyclohexane of the formula C_7F_{14} which boil at about 66.4° C. at 746 mm Hg.

5,182,043

SULFOBENZOYL END-CAPPED ESTER OLIGOMERS USEFUL AS SOIL RELEASE AGENTS IN GRANULAR DETERGENT COMPOSITIONS

Stephen W. Morrall, Guilford, Ind.; Eugene P. Gosselink, Cincinnati, Ohio; Robert Y. Pan, Cincinnati, Ohio, and Bala C. Nayar, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 429,887, Oct. 31, 1989, abandoned. This application Jul. 25, 1991, Ser. No. 737,892

Int. Cl.[5] C11D *17/00*; D06M *10/08*

U.S. Cl. 252—174 **21 Claims**

1. An oligomeric or polymeric composition comprising a substantially linear, sulfobenzoyl end-capped ester; said ester comprising, per mole of said ester:

i) from about 1 to about 2 moles of sulfobenzoyl end-capping units of the formula $(MO_3S)(C_6H_4)C(O)$— wherein M is sodium;

ii) from about 2 to about 10 moles of oxyethyleneoxy units and oxy-1,2-propyleneoxy units in a mole ratio of oxyethyleneoxy units to oxy-1,2-propyleneoxy units of from about 2.5:1 to about 15:1; and

iii) from about 1 to about 9 moles of terephthaloyl units;

wherein the mole ratio of said oxyalkyleneoxy units to said terephthaloyl units is from about 2:1 to about 1.1:1; and wherein said ester is substantially amorphous in form.

5,182,044

ZEOLITE CONTAINING LIQUID DETERGENT COMPOSITION

Shigeru Yanaba; Masataka Shiobara; Koji Masamizu; Kiyoshi Morohara, and Seiji Abe, all of Tokyo, Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jan. 9, 1991, Ser. No. 638,963

Claims priority, application Japan, Jun. 1, 1990, 2-143472

Int. Cl.[5] C11D *3/12, 3/20, 3/37, 3/26*

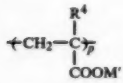
U.S. Cl. 252—174.24 **5 Claims**

1. A liquid detergent composition comprising:

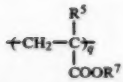
(a) 5 to 50% by weight of a surfactant;

(b) 1 to 30% by weight of a zeolite; and

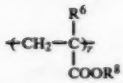
(c) 0.1 to 5% by weight or a copolymer consisting of essentially of the copolymerized components having the formulae (III), (IV), and (V):



(III)



(IV)



(V)

wherein

R^4 represents hydrogen or methyl,

R^5 represents hydrogen or methyl,

R^6 represents hydrogen or methyl,

R^7 represents methyl or ethyl,

R^8 represents an alkyl or alkenyl having 3 to 24 carbon atoms,

M′ represents hydrogen or a counter ion,

p/q is 2/8 to 8/2 (mol ratio) and $r/(p+q+r)=1/50$ to 20/50 (mol ratio); and

a balance of water.

5,182,045

LATE PERACID PRECURSORS

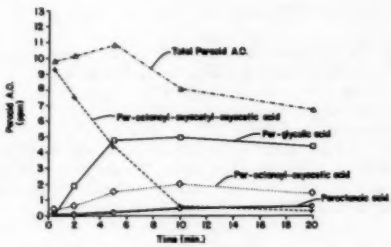
Richard R. Rowland, Danville; Ronald A. Fong, Modesto; Richard J. Wiersema, Tracy, and Alfred G. Zielske, Pleasanton, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Mar. 29, 1989, Ser. No. 329,982

The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.

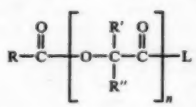
Int. Cl.[5] C09K *3/00*

U.S. Cl. 252—186.38 **14 Claims**



1. A bleaching composition comprising:

(a) a peracid precursor having the general structure:



wherein n is an integer from 2 to about 10; R is C_{1-20} linear or branched alkyl, alkoxylated alkyl, cycloalkyl, aryl, alkylaryl, substituted aryl; R′ and R″ are independently H, C_{1-20} alkyl, aryl, C_{1-20} alkylaryl, substituted aryl, and $NR_3^{\alpha}+$, wherein R^{α} is C_{1-30} alkyl; and L is a leaving group selected from the group consisting of:

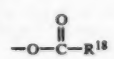
(i)

wherein Y and Z are individually H, SO_3M, CO_2M, SO_4M, OH, halo substituent, OR^2, R^3, NR_3^4X, and mixtures thereof, wherein M is an alkali metal or alkaline earth metal counterion, R^2 is C_{1-20} alkyl, R^3 is C_{1-6} alkyl, R^4 is C_{1-30} alkyl and X is a counterpart ion thereto, and Y and Z can be the same or different;

(ii) halide;

—ONR^6, wherein R^6 contains at least one carbon which is singly or doubly bonded directly to N;

(iv)



wherein R^{18} is C_{1-10} alkl; and

(v) mixtures thereof; and

(b) bleach-effective amount of a peroxygen source.

5,182,046

SODIUM BOROHYDRIDE COMPOSITION AND IMPROVED METHOD OF PRODUCING COMPACTED SODIUM BOROHYDRIDE

Richard A. Patton, Danvers, and Walter A. Richardson, Beverly, both of Mass., assignors to Morton International, Inc., Chicago, Ill.

Filed Dec. 5, 1990, Ser. No. 622,697
Int. Cl.[5] C01B 6/04, 35/10
U.S. Cl. 252—188.26 13 Claims

1. A composition consisting essentially of sodium borohydride and a silica-based anticaking agent comprising at least about 90 percent by weight silica at a level of between about 0.05 and about 2 weight percent relative to the sodium borohydride.

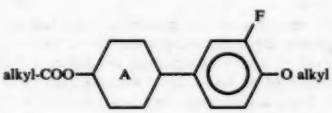
5,182,047

FLUORINATED BIPHENYLDIOLE DERIVATIVES

David Coates; Ian C. Sage, both of Dorset, and Simon Greenfield, Poole, all of Great Britain, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Fed. Rep. of Germany

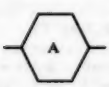
PCT No. PCT/EP89/00558, § 371 Date Jul. 14, 1989, § 102(e) Date Jul. 14, 1989, PCT Pub. No. WO89/12039, PCT Pub. Date Dec. 14, 1989
PCT Filed May 20, 1989, Ser. No. 399,541
Claims priority, application United Kingdom, Jun. 2, 1988, 8813024
Int. Cl.[5] C09K 19/12, 19/30, 19.34
U.S. Cl. 252—299.66 5 Claims

1. A chiral, tilted, smectric liquid crystal phase comprising a mixture of at least two compounds, wherein at least one compound is an achiral fluorinated biphenyldiole of formula Ia



(Ia)

wherein alkyl each independently represents straight-chained alkyl with 5 to 12 carbon atoms, and



denotes a 1,4-phenylene group optionally substituted by 1-4 F atoms.

5,182,048

COLLOIDAL ANTIMONY PENTOXIDE POWDERS AND METHOD OF MAKING

Donald P. Kintz, Westford, and David L. Catone, Hopkinton, both of Mass., assignors to Nyacol Products Inc., Ashland, Mass.

Filed Sep. 30, 1991, Ser. No. 767,482
Int. Cl.[5] B01F 3/12; C09K 21/04, 21/00
U.S. Cl. 252—363.5 4 Claims

1. A colloidal antimony pentoxide powder comprising a mixture of antimony pentoxide, phosphoric acid and an ethoxylated fatty alkyl amine, wherein said powder is dispersible in a polar solvent such that at least 99.9% of the dispersion will pass through a nominal 8 micron filter.

5,182,049

INTUMESCENCE MEDIA AND THE USE THEREOF

Wulf von Bonin, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 15, 1991, Ser. No. 730,360
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1990, 4023310
The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.
Int. Cl.[5] C04B 20/06, 18/00; C09D 5/16, 5/18
U.S. Cl. 252—378 R 13 Claims

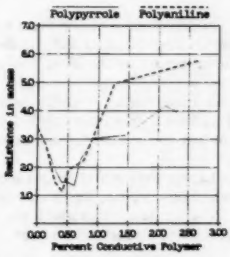
1. An intumescence medium which contains an intumescence effective amount of at least one ammonium or amine salt of an acid phosphate of a metal of the 2nd or 3rd group of the periodic system of the elements.

5,182,050

EXTRINSICALLY/INTRINSICALLY CONDUCTIVE GEL

James L. Joyce, Jr.; Warren C. Jones, both of Winston-Salem; John R. Rowlette, Sr., Clemmons; David F. MacInnes, Jr., Greensboro, and Navin N. Vyas, Winston-Salem, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 24, 1991, Ser. No. 782,831
Int. Cl.[5] H01B 1/00
U.S. Cl. 252—500 4 Claims



1. An electrically conductive gel comprising an extrinsically conductive silicone gel having dispersed therein a quantity of an intrinsically conductive polymer selected from the group consisting of polypyrrole, polyaniline, polyanisidine, polythiopene, and derivatives thereof, said polymer being present in the amount of between about 0.03 to 1.6%, by weight.

5,182,051

RAIOACTIVE TRACING WITH PARTICLES

Thomas R. Bandy, Katy; Donna A. Read, Houston, both of Tex., and Edward S. Wallace, Englewood, Colo., assignors to Pro-Technics International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 466,238, Jan. 17, 1990, abandoned. This application Mar. 7, 1991, Ser. No. 666,044
Int. Cl.[5] G21G 4/04
U.S. Cl. 252—645 18 Claims

1. A non-radioactive particle comprising a sintered ceramic material having embedded therein a target element wherein the target element is either iridium or scandium.

5,182,052

METHOD OF MANUFACTURING TUBES AND DEVICE FOR CARRYING OUT THE METHOD

Hans Lydtin, Stolberg, and Rolf Clasen, Aachen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

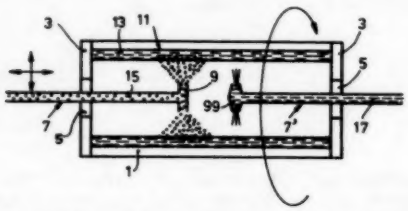
Filed Feb. 15, 1985, Ser. No. 702,206

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406148

The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.

Int. Cl.[5] B29D *11/00*

U.S. Cl. 264—1.2 40 Claims



1. A method of manufacturing a tube, said method comprising the steps of:

providing a tubular mold having an inner wall and a longitudinal axis;

rotating the mold about its longitudinal axis;

introducing a liquid binder into the tubular mold, said liquid binder being deposited on the inner wall of the rotating mold;

introducing a powdered material into the tubular mold after the liquid binder is introduced, said powder being deposited in the liquid binder on the inner wall of the rotating mold; and

removing excess liquid binder from the mixture of binder and powder to form a green tubular body;

characterized in that the method further comprises the steps of:

successively and alternately introducing a second amount of liquid binder and powder into the tubular mold, said liquid binder and powder being deposited on the previously deposited mixture of binder and powder.

5,182,053

PROCESS FOR FORMING INTRAOCULAR LENSES HAVING HAPTICS WITH HIGH FRACTURE TOUGHNESS

Edwin A. Creasman, Fontana; Thomas R. Paul, Westlake Village; Kenneth E. Weber, Pacific Palisades; David R. Navarrete, Cerritos; Jimmy D. McCullough, Chino, and Churchai T. Soodjinda, West Covina, all of Calif., assignors to Optical Radiation Corporation, Azusa, Calif.

Continuation-in-part of Ser. No. 789,212, Mar. 2, 1990, Pat. No. 5,037,435. This application Feb. 28, 1991, Ser. No. 662,762

Int. Cl.[5] B29D *11/00*

U.S. Cl. 264—1.4 9 Claims

1. A process for preparing an intraocular lens having haptics with high fracture toughness comprising:

mixing uncured first polymer matrix and solid particles to form a curable first polymer composition;

introducing the curable first polymer composition into a mold cavity;

applying ultrasonic energy to the mold and the curable first polymer composition contained therein for a time sufficient for the curable first polymer composition to solidify;

applying sufficient heat to the first polymer composition to complete curing of the first polymer composition to form a first molded construction;

removing the first molded construction from the mold;

forming a hole in the first molded constructions;

filling the hole with a curable second polymer composition comprising uncured second polymer matrix;

curing the second polymer composition to thereby form a

cured polymer final construction comprising a region of cured second polymer composition surrounded by cured first polymer composition; and

forming an intraocular lens from the cured polymer final construction.

5,182,054

PROCESS FOR GRANULATING PERBORATE MONOHYDRATE

Volker Bauer; Wilfried Raehse, both of Duesseldorf; Klaus Koester, and Jochen Jacobs, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

PCT No. PCT/EP90/01320, § 371 Date Feb. 19, 1992, § 102(e) Date Feb. 19, 1992, PCT Pub. No. WO91/02696, PCT Pub. Date Mar. 7, 1991

PCT Filed Aug. 10, 1990, Ser. No. 834,302

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1989, 3927398; Nov. 9, 1989, 3937251

Int. Cl.[5] B29B *9/00*

U.S. Cl. 264—15 17 Claims

1. The process of granulating sodium perborate monohydrate, comprising dry-compacting a mixture of sodium perborate monohydrate and a compacting aid selected from the group consisting of an alkali metal salt, alkaline earth metal salt, carbohydrate, anionic surfactant, and nonionic surfactant, and size-reducing the compactate formed to the desired particle size.

5,182,055

METHOD OF MAKING A THREE-DIMENSIONAL OBJECT BY STEREOLITHOGRAPHY

Joseph W. Allison, Valencia; Jan Richter, Los Angeles; Craig M. Childers, Santa Clarita; Dennis R. Smalley, Baldwin Park; Charles W. Hull, Santa Clarita, and Paul F. Jacobs, La Crescenta, all of Calif., assignors to 3D Systems, Inc., Valencia, Calif.

Continuation-in-part of Ser. No. 516,145, Apr. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 429,435, Oct. 30, 1989, Pat. No. 5,130,064, which is a continuation-in-part of Ser. No. 331,644, Mar. 31, 1989, which is a continuation-in-part of Ser. No. 269,801, Nov. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 182,830, Apr. 18, 1988, Pat. No. 5,059,359. This application May 17, 1991, Ser. No. 702,031

Int. Cl.[5] B29C *35/08, 41/02*

U.S. Cl. 264—22 18 Claims

1. In a stereolithographic method for constructing an object from a medium solidifiable upon exposure to synergistic stimulation, comprising the successive formation of layers of the medium applied to previously formed layers of the medium, each layer of the medium having a desired thickness, and selectively exposing the layers to synergistic stimulation in a pattern corresponding to cross-sections of the three-dimensional object, to build up the three-dimensional object layer by layer, the pattern including paths of exposure defined by vec-

tors, with the exposure of the vectors resulting in a cure depth and a cure width, the improvement comprising the steps of:

partially solidifying a portion of a first layer according to a first set of vectors, the vectors of the first set being substantially parallel to each other with their exposure specified such that the resulting cure depth of the vectors of the first set is less than the desired thickness of the first layer of the medium and with adjacent vectors of the first set spaced apart from each other by at least the cure width; and

at least partially solidifying the portion of the first layer with a second set of vectors with adjacent vectors of the second set spaced apart from each other by at least the cure width, the vectors of the second set being substantially parallel to each other and not parallel to the vectors of the first set, such that at least some of the vectors of the second set intersect at least some of the vectors of the first set, the vectors of the second set having exposure specified such that their resulting cure depth achieves adhesion to the previously formed layer only at points where vectors of the second set overlap vectors of the first set, with no adhesion occurring at points where vectors of the first set and second set do not overlap.

5,182,056

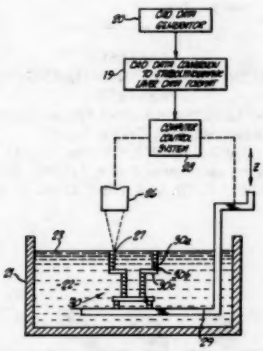
STEREOLITHOGRAPHY METHOD AND APPARATUS EMPLOYING VARIOUS PENETRATION DEPTHS

Stuart T. Spence, S. Pasadena, and Dennis R. Smalley, Baldwin Park, both of Calif., assignors to 3D Systems, Inc., Valencia, Calif.

Continuation-in-part of Ser. No. 268,816, Nov. 8, 1988, Pat. No. 5,058,988, Ser. No. 268,837, Nov. 8, 1988, Ser. No. 268,907, Nov. 8, 1988, Pat. No. 5,059,021, and Ser. No. 331,644, Mar. 31, 1989, which is a continuation-in-part of Ser. No. 269,801, Nov. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 182,830, Apr. 18, 1988, Pat. No. 5,059,359, said Ser. No. 268,816, Ser. No. 268,837, and Ser. No. 268,907, each is a continuation-in-part of Ser. No. 182,830,. This application Oct. 27, 1989, Ser. No. 429,911

Int. Cl.[5] B29C *35/08, 41/02*

U.S. Cl. 264—22 **44 Claims**



1. An improved stereolithographic method for producing a three-dimensional object by forming layers of material curable in response to synergistic stimulation adjacent to previously formed layers of material and successively curing the layers of material by exposing the layers of material to a pattern of synergistic stimulation correspond to successive cross-section of the three-dimensional object, the improvement comprising the steps of:

curing at least a portion of a first layer of a three-dimensional object, said portion being cured using a first exposure of synergistic stimulation having a first penetration depth; and

curing said portion of the first layer using at least a second exposure of synergistic stimulation having a second penetration depth wherein the first and second penetration depths are different.

5,182,057

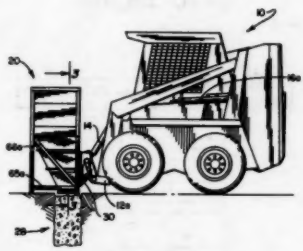
METHOD FOR IN SITU DISPENSING OF CEMENTITIOUS MATERIALS AT REMOTE LOCATIONS

Robert J. Johnson, 4221 C.R. 20, Ada, Ohio 45810

Filed Dec. 27, 1991, Ser. No. 815,074

Int. Cl.[5] B28B *13/00;* **B65D** *47/00;* **E02D** *5/34;* **E04B** *1/16*

U.S. Cl. 264—31 **7 Claims**



1. A method for facile filling of forms with cementitious material at remote locations by an operator of a host transport apparatus, which host transport apparatus has an articulated arm and a cab in which is stationed said operator, which comprises the steps of:

filling a transportable bin with said material, said bin being attaches to said host transport apparatus and comprising:

a container having an accessible interior truncated at a base which base has a coverable aperture;

a remotely and host transport apparatus operator actuable door covering said aperture for selectively dispensing said material through said aperture; and

coupling means for attaching said bin to said articulated arm of said host transport apparatus;

moving said host transport apparatus having said bin attached thereto into a position where said actuable door covering said aperture of said bin is vertically disposed above a form at a remote location; and

actuating said door by said operator stationed in said cab for a time sufficient for dispensing a determined amount of said cementitious material through said aperture into said form at said remote location.

5,182,058

FOAMING AGENT WITH ALCOHOL ACTIVATOR AND METHOD FOR PRODUCING NON-CHALKING POLYMERS

Jawad H. Murib, and Pradeep D. Damle, both of Cincinnati, Ohio, assignors to Quantum Chemical Corporation, New York, N.Y.

Filed Nov. 22, 1991, Ser. No. 796,482

Int. Cl.[5] C08J *9/06*

U.S. Cl. 264—54 **9 Claims**

1. A method of making a foamed injection-molded article, the method comprising:

dispersing into a polymer selected from the group consisting of ethylene and propylene homopolymers and copolymers, polystyrene, acylonitrile-butadiene-styrene, poly(-phenylene oxide), and poly(phenylene ether), a foaming agent comprising (i) sodium borohydride and (ii) a polyhydric alcohol selected from the group consisting of erythritol, pentaerythritol, arabitol, xylitol, adonitol, man-

nitol, dulcitol, and sorbitol, to form a mixture with the sodium borohydride comprising from 0.01 to 5.0 weight percent of the mixture;

heating the mixture whereby the foaming agent releases gas; and

subsequently injecting said mixture into a mold obtaining expansion of said polymer into a molded foamed article.

5,182,059

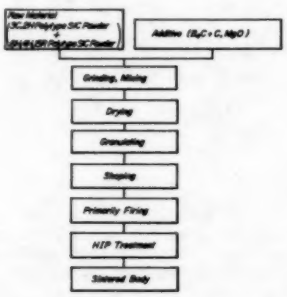
PROCESS FOR PRODUCING HIGH DENSITY SIC SINTERED BODIES

Shinji Kawasaki, Nagoya; Masaharu Kajita, Tajimi, and Keiji Matsuhiro, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 463,129, Jan. 10, 1990, abandoned. This application Jun. 15, 1992, Ser. No. 899,159

Int. Cl.[5] C04B *35/56*

U.S. Cl. 264—65 **1 Claim**



1. A method of producing high density SiC sintered bodies, comprising the steps of:

formulating a powder consisting essentially of:

(a) 85–99.7 wt % SiC powder consisting essentially of

(i) 95.0 to 99.9 wt % of a first SiC powder consisting of at least one of 3C and 2H polytype SiC, and

(ii) 0.1 to 5.0 wt % of a second SiC powder consistng of at least one of 6H, 4H and 15R polytype SiC, said second SiC powder having an average grain diameter which is less than twice that of siad first SiC powder;

(b) 0.1 to 5.0 wt %, when calculated as boron, boron or a boron-containing compound;

(c) 0.1 to 5.0 wt %, when calculated as carbon, carbon or a carbon-producing organic compound; and

(d) 0.1 to 5.0 wt % MgO;

mixing the formulated powder;

shaping the formulated powder into a shaped body;

firing the shaped body in vacuum or an inert gas atmosphere in a temperature range from 1,900° to 2,300° C.; and

hot isostatically pressing the fired body in an inert gas atmosphere in a temperature range from 1,800° to 2,200° C. under a pressure of not less than 100 atms.

5,182,060

CONTINUOUS FORMING OF COMPOSITES

Imre Berecz, Santa Margarita, Calif., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 31, 1991, Ser. No. 721,781

Int. Cl.[5] B29C *47/18, 43/30*

U.S. Cl. 264—70 **6 Claims**

1. A method for shaping a fiber reinforced thermoplastic resin composite having a specified thickness into a specified cross section configuration by means of a matched die and punch defining said specified cross section configuration, said method comprising:

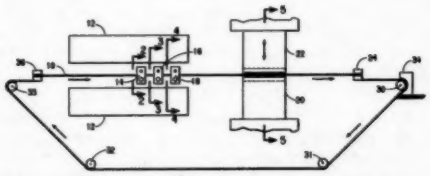
(a) heating the composite to a temperature of about the melting temperature of the resin prior to said composite entering said matched die and punch;

(b) pulling the heated composite through and in direct contact with said matched die and punch

(c) moving said punch toward and away from said die at a rate to apply rapidly repeating blows to the heated composite to shape the composite into said cross sectional configuration as the heated composite is pulled through the matched die and punch; and

(d) cooling said composite sufficiently to retain said cross sectional configuration.

2. A method for shaping an elongated fiber reinforced thermoplastic resin composite having a specified thickness into a specified cross sectional configuration around the longitudinal axis of the composite by means of a set of rotatable rollers and a matched die and punch defined by configuration, said method comprising:



(a) heating the composite to a temperature about the melting temperature of the resin prior to said composite entering said rollers and said matched die and punch;

(b) pulling the heated composite through and in direct contact with said set of rotatable rollers arranged to define the near net shape of said cross sectional configuration;

(c) passing composite from said set of rotatable rollers through and in direct contact with said matched die and punch defining said cross sectional configuration;

(d) moving said punch toward and away from said die at a rate to apply rapidly repeating blows to the heated composite to shape the composite into said cross sectional configuration as the heated composite is pulled through the matched die and punch; and

(e) cooling and composite sufficiently to retain said cross sectional configuration.

5,182,061

METHOD OF VIBRATION-MOLDING FRICTION MEMBER

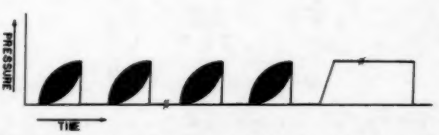
Go Yasuda, and Akira Wada, both of Tokyo, Japan, assignors to Nisshinbo Industries, Inc., Tokyo, Japan

Filed Jul. 9, 1991, Ser. No. 729,712

Claims priority, application Japan, Jul. 20, 1990, 2-190427

Int. Cl.[5] B28B *1/08;* **B29C** *35/00, 43/02*

U.S. Cl. 264—72 **9 Claims**



1. A vibration molding method in which a desired specific gravity and porosity are achieved in a molded friction member, the method comprising the steps of:

a. accommodating materials forming the molded friction member in a mold in a press;

b. increasing and relaxing pressure on the materials in the mold a predetermined plural number of times, the pressure at which relaxation begins being a predetermined rated pressure;

c. vibrating the mold while the pressure on the materials is increasing, the vibrations having a predetermined frequency and predetermined amplitudes to achieve the desired specific gravity and porosity; and

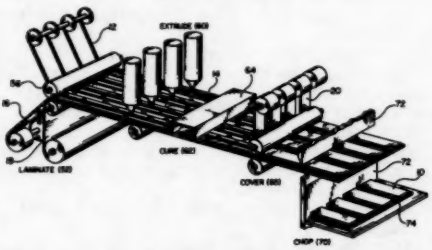
d. after final relaxation in step b., applying the rated pressure to the materials in the mold for a predetermined period of time without vibration.

5,182,062

RESPONDER TARGET FOR THEFT DETECTION APPARATUS

J. Kelly Lee; Svetlana Reznik, and Matthias H. Regelsberger, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 14, 1991, Ser. No. 640,744
Int. Cl.[5] B32B *11/16*
U.S. Cl. 264—129 **2 Claims**



1. A method of making a deactivatable responder target for use in a magnetic security system comprising the steps of:

a. coating a dispersion of ferric oxide particles in a polymer binder on a film base, the ferric oxide particles having the formula Fe_3O_4 and a coercivity H_C in the range of 50 to 150 Oe to form a control element;

b. laminating a strip of high permeability and low coercivity magnetic material to the control element, the strip of high permeability and low coercivity magnetic material forming a signal element; and

c. chopping the laminated control element and signal elements into strips to form the responder target.

5,182,063

METHOD AND MEANS OF PUBLISHING IMAGES HAVING COLORATION AND THREE-DIMENSIONAL TEXTURE

Stefan Lang, Scarborough, and Harvey Kalef, Toronto, both of Canada, assignors to Artagraph Reproduction Technology Incorporated, Canada

Continuation-in-part of Ser. No. 507,743, Apr. 12, 1990, abandoned. This application Jun. 29, 1990, Ser. No. 545,658
Int. Cl.[5] B29C *33/40*
U.S. Cl. 264—132 **34 Claims**

1. The method of reproducing a multi-colored image having three-dimensional texture which includes the steps of:

(1) photomechanically printing a copy of the multi-colored image onto a carrier substrate;

(2) forming a three-dimensional matrix by

(a) selectively thermoforming a backing substrate with a canvas texture similar to that of a canvas carrier substrate,

(b) painting the backing substrate to form a painted surface texture similar to that of the multi-colored image;

(3) laminating the matrix to an electrolytic backing plate;

(4) electrolytically forming a female embossing die on the backing plate corresponding to the surface texture of the matrix;

(5) forming a male embossing die complemental to said female embossing die; and

(6) squeezing the carrier of (1) between the male and female embossing dies of (4) and (5) to produce a copy exhibiting

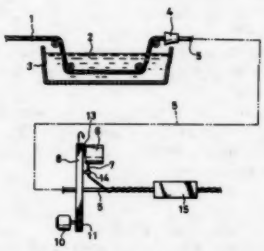
the coloration and three-dimensional textured configuration of the multi-colored image.

5,182,064

METHOD FOR PRODUCING FIBER REINFORCED PLASTIC RODS HAVING HELICAL RIBS

Hitoharu Ishizuka, and Reiko Kubo, both of Mitaka, Japan, assignors to Nippon Petrochemicals Company, Limited, Tokyo, Japan

Filed Jun. 14, 1991, Ser. No. 715,382
Claims priority, application Japan, Oct. 17, 1990, 2-278569
Int. Cl.[5] B29C *67/00*
U.S. Cl. 264—137 **9 Claims**



1. A method for producing a fiber reinforced plastic rod having ribs on its surface, which method comprises the steps of:

preparing a substrate forming member by impregnating a reinforcing material of continuous long fiber bundles with an uncured liquid resin;

separately preparing a rib forming member consisting of a reinforcing material of fiber bundles;

helically applying said rib forming member on the surface of said substrate forming member under tension such that said rib forming member partially sinks into the surface portion of said substrate member and allowing said uncured liquid resin of said substrate forming member to impregnate into said rib forming member; and

curing said substrate forming member together with said rod forming member into an integral body.

5,182,065

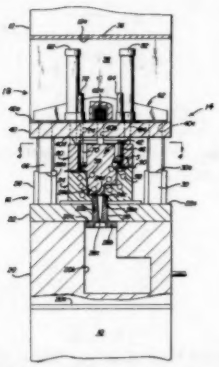
METHOD FOR PRODUCING STRUCTURAL INJECTION MOLDED PARTS USING LOST MOTION MOVEMENT BETWEEN A MOLD AND SURROUNDING CUTTING BLADE

Stanley Piotrowski, Kitchener, and Ronald I. Levine, Waterloo, both of Canada, assignors to Ontario Die Company Limited, Ontario, Canada

Continuation of Ser. No. 516,183, Apr. 30, 1990, abandoned. This application Oct. 11, 1991, Ser. No. 774,128

Int. Cl.[5] B28B *7/14;* **B29C** *33/24, 45/16*

U.S. Cl. 264—153 **10 Claims**



1. A method of forming a structural injection molded part comprising the steps of:

providing a mold assembly including a female mold defining a concavity and a male mold defining a convexity sized to fit within the concavity of the female mold to defined a mold cavity corresponding to the shape of the part to be molded;

positioning a closed loop cutting blade in surrounding relation to one of said molds;

positioning reinforcing material over the concavity of the female mold;

moving said male mold convexity into said female mold concavity to position said reinforcing material in said mold cavity;

thereafter moving said cutting blade independently of said one mold to trim said part; and

injecting resin into said mold cavity to produce a structural injection molded part.

5,182,066

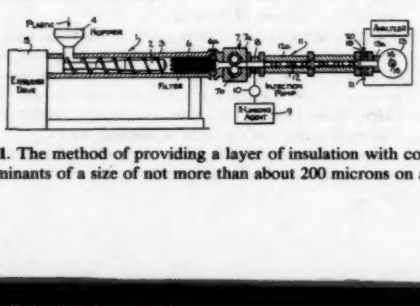
EXTRUSION PROCESS AND APPARATUS FOR LOW CONTAMINANT CABLE INSULATION

Carlo Marin, Greenwood, S.C., assignor to Pirelli Cable Corporation, Florham Park, N.J.

Filed Nov. 27, 1991, Ser. No. 800,645

Int. Cl.[5] B29C *47/68*

U.S. Cl. 264—169 **16 Claims**



1. The method of providing a layer of insulation with contaminants of a size of not more than about 200 microns on an electrical cable core and comprising at least a conductor which is long relative to its thickness, said method comprising:

supplying insulation material under pressure to a filter which prevents the passage therethrough of particles greater than about 200 microns and causing said insulation material to pass through and exit from said filter as filtered insulation material;

as said filtered insulation material exits from said filter, supplying said filtered insulation to a pump which increases the pressure applied to said filtered insulation material which exits from said pump;

as said filtered insulation material exits from said pump, supplying said filtered insulation material to a mixing means, said mixing means having an outlet from which said filtered insulation exits;

as said filtered insulation material exits from said outlet of said mixing means, supplying said filtered insulation material to an extruder; and

at said extruder, extruding said filtered insulation material around the cable core as it is advanced in the direction of its length.

7. Apparatus for providing a layer of insulation with a contaminant size of not more than about 200 microns on an electrical cable core which is long relative to its thickness and comprising at least a conductor, said apparatus comprising:

an extruder for plasticizing and applying pressure to insulation material which is to form the layer of insulation, said extruder having an input for receiving said insulation material and an output,

means for supplying said insulation material to said input of said extruder;

a filter which prevents the passage therethrough of contaminants of a size greater than about 200 microns, said filter having an input connected to said output of said extruder and an output from which filtered insulation material exits;

a pump having an input connected to said output of said filter for applying pressure to said filtered insulation material, said pump having an output from which said filtered material exits under pressure;

mixing means having an input connected to said output of said pump and an output from which said filtered insulation material exits after mixing by said mixing means;

a further extruder having an input connected to said output of said mixing means and means for receiving a cable core and applying said filtered insulation around the cable core as the latter is advanced through said extrusion apparatus.

5,182,067

PROCESS OF MAKING FIBERS OF SULFONATED POLY(P-PHENYLENE TEREPHTHALAMIDE)

Minshon J. Chiou, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 435,829, Nov. 9, 1989. This application Jun. 6, 1991, Ser. No. 711,583

Int. Cl.[5] D01D *5/06;* **D01F** *6/60*

U.S. Cl. 264—184 **1 Claim**

1. A process for making a fiber from sulfonated PPD-T comprising the steps of:

(a) agitating substantially unsulfonated PPD-T having an intent viscosity greater than 6 in sulfuric acid having a concentration of 100.5 to 102.5% in an amount such that there is 17 to 20 weight percent of PPD-T in the sulfuric acid, for a duration of 1 to 3 hours at a temperature of 70° to 80° C. to dissolve and sulfonate the PPD-T;

(b) extruding the resulting solution from an orifice through a layer of inert non-coagulating fluid into a coagulating bath to coagulate the resulting fiber;

(c) washing the coagulated fiber in an aqueous fiber-washing solution;

(d) drying the fiber to yield a dry as-spun fiber of PPD-T having an inherent viscosity greater than 4.5 and a sulfo-

nation of 0.5 to 3.0% sulfur, as bound sulfonic acid or sulfonate groups.

5,182,068

HIGH SPEED SPINNING PROCESS

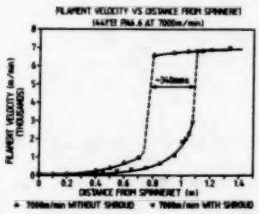
John Richardson, Gloucester, England, assignor to Imperial Chemical Industries PLC, London, England

Filed May 6, 1991, Ser. No. 696,202

Claims priority, application United Kingdom, May 22, 1990, 9011464

Int. Cl.[5] D01D *5/12;* **D01F** *6/60, 6/62*

U.S. Cl. 264—210.8 **1 Claim**



1. A process for the melt spinning of polyethylene terephthalate or polyhexamethylene adipamide into a filamentary yarn in which the spinning threadline is passed through a heated shroud located immediately below the spinneret, the threadline is cooled by an air current and then taken up at a speed of 7 km/min or more the improvement being that the temperature of the environment within the shroud, and in consequence the temperature of filaments themselves, is progressively reduced, before the filaments in the threadline are cooled by the air current such that the neck draw ratio which occurs in the filaments is 3.0 or less.

5,182,069

PROCESS FOR PRODUCING MICROPATTERN-EMBOSSED ORIENTED ELASTOMER FILMS

Richard J. Wick, Ingleside, Ill., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jan. 4, 1991, Ser. No. 637,359

Int. Cl.[5] B29C *59/04, 55/08*

U.S. Cl. 264—210.2 **4 Claims**

1. An in-line process for producing an embossed and oriented heat-shrinkable, non-blocking film of thermoplastic elastomer blend composition, comprising the steps of:

(a) producing an extrudable thermoplastic elastomer composition comprising a blend of at least one olefinic elastomer, an ethylene copolymer and a process oil;

(b) extruding said composition in the form of a continuous molten web;

(c) passing said web in the nip between rolls, at least one of which is a chilled embossing roll having an engraved geometric micropattern surface comprising between about 100 to 250 intersecting lines per inch, each having a depth between about 0.001 and 0.0025 inch, to emboss said geometric micropattern as a repetitive pattern of intersecting linear depressions into one or both surfaces of said web while solidifying said web, and

(d) passing said embossed, solidified web into an orientation device to stretch said web at an elevated temperature in the transverse direction and/or in the machine direction to an extent between about 200% and 400% whereby said embossed depressions are stretched and widened to produce an embossed and oriented thermoplastic elastomer film having excellent elastic and heat-shrink properties and having embossed surface(s) which retain the effects of the embossment, after orientation of the film, so as to have an appearance and feel similar to satin and excellent non-blocking properties.

5,182,070

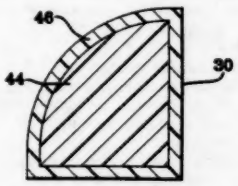
PROCESS FOR MOLDING POLYMER BEARING CAGE WITH AMORPHOUS CASE

Keith L. Seifert, Torrington, and Robert E. Furst, Griswold, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Division of Ser. No. 681,283, Apr. 8, 1991, Pat. No. 5,104,241. This application Dec. 9, 1991, Ser. No. 805,339

Int. Cl.[5] B29C *45/73*

U.S. Cl. 264—241 **8 Claims**



1. A method for producing a bearing cage having first and second rails joined together by a plurality of bars, comprising:

heating a hold to a molding temperature:

heating a crystalline plastic resin material to an injection temperature; and

injecting said crystalline plastic resin material into said mold in a location intermediate ends of one of said plurality of bars, wherein said molding temperature and said injection temperature are selected to create an amorphous layer on at least part of the crystalline plastic resin material.

5,182,071

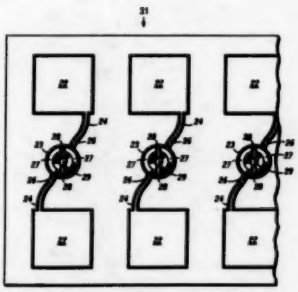
METHOD OF MOLDING A CARRIER RING TO LEADS

James H. Knapp, Gilbert, and Keith E. Nelson, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1990, Ser. No. 627,526

Int. Cl.[5] B29C *45/02, 45/58*

U.S. Cl. 264—272.13 **12 Claims**



1. A method of molding a carrier ring to leads of a semiconductor package which comprises:

providing an assembled semiconductor package having leads;

providing molding assembly having at least one pot wherein the pot has an irregular shaped bottom, at least one cavity for receiving the semiconductor package, and at least one runner connecting the pot to the cavity;

placing the semiconductor package into the cavity;

heating the molding assembly to a temperature of approximately 125 degrees centigrade;

placing an encapsulating material having a glass transition temperature above said temperature inside the molding pot; and

expanding the encapsulating material and the leads at substantial equal rates by maintaining the encapsulation material at said temperate while fluidizing the encapsulating material and forming a molded carrier ring on the leads.

5,182,072

PROCESS FOR PRODUCING A MODIFIED ETHYLENE/VINYL ACETATE COPOLYMER

Kiroku Tsukada, and Kunio Kotani, both of Yokohama, Japan, assignors to Nippon Unicar Company Limited, Danbury, Conn.

Filed Nov. 4, 1991, Ser. No. 787,134

Claims priority, application Japan, Oct. 29, 1990, 2-288379

Int. Cl.[5] B29C *47/36*

U.S. Cl. 264—349 **8 Claims**

1. A process comprising mixing:

(i) a copolymer of ethylene and vinyl acetate containing about 20 to about 50 percent by weight vinyl acetate based on the weight of the copolymer; and, for each 100 parts by weight of copolymer,

(ii) about 1 to about 5 parts by weight of an organopolysiloxane having a viscosity of at least about 10 centistokes at 23° C.; and, optionally,

(iii) about 0.001 to about 1 part by weight of an organic peroxide

at a temperature of at least about 160° C. for a sufficient length of time to provide the mixture with a melt index of about 0.05 to about 8.0 grams per 10 minutes.

5,182,073

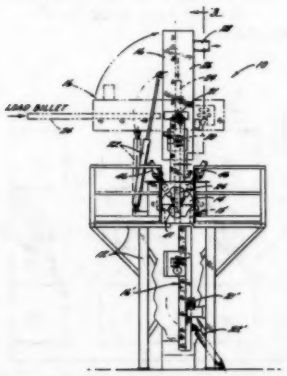
APPARATUS FOR SURFACE TREATING METAL BILLETS

Salvador L. Camacho, Wake County, N.C., assignor to Plasma Energy Corporation, Raleigh, N.C.

Filed Nov. 1, 1990, Ser. No. 607,551

Int. Cl.[5] B23K *7/06*

U.S. Cl. 266—52 **17 Claims**



1. Apparatus for heat treating elongate metal billets comprising:

a heating chamber through which said billets sequentially and longitudinally pass along a substantially vertical path of travel;

a billet mold within said chamber adjacent said path of travel;

billet heating means within said chamber adjacent said path of travel for heating said billets passing along said path of travel; said billet heating means including a plurality of plasma arc torches located at circumferentially spaced intervals about and in adjacent relationship to said billet path of travel upstream from said mold;

billet transporting means for transporting said billets to, substantially vertically through, and from said heating chamber; said transporting means including at least one billet transporting assembly mounted for movement between a first position wherein said assembly extends substantially vertically, and a second position wherein said assembly extends generally horizontally;

said billet transporting assembly including a plurality of billet engaging rolls mounted in spaced relationship to each other along the length of said assembly for engagement with said billets transported by said assembly; and

drive means for moving said assembly between said positions thereof.

5,182,074

APPARATUS FOR CONTINUOUSLY COOLING METAL STRIP

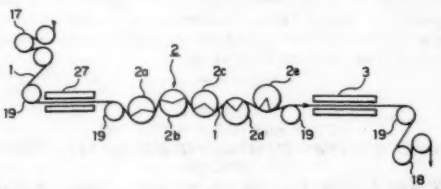
Osami Yoshioka; Naoki Matsui; Hiroaki Sato; Kouji Omori; Masayuki Yamazaki; Masafumi Suzuki; Hitoshi Oishi; Naoto Kitagawa; Takaya Seike, and Yasuhiro Araki, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Jul. 22, 1991, Ser. No. 734,131

Claims priority, application Japan, Jul. 31, 1990, 2-202724; Jul. 31, 1990, 2-202725

Int. Cl.[5] C21D *11/00*

U.S. Cl. 266—87 **20 Claims**



1. An apparatus for continuously cooling a metal strip, which comprises:

at least one cooling roll, which is freely rotatable and in contact with a metal strip continuously travelling in the longitudinal direction thereof, for continuously cooling said metal strip, said cooling roll have a length at least equal to the width of said metal strip, a cooling liquid flowing through the interior of said cooling roll to continuously cool same, and a contact area between the surface of said cooling roll and the surface of said metal strip being controllable;

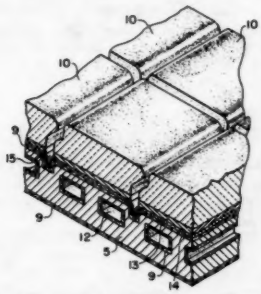
a gas cooler, arranged on an exit side of said at least one cooling roll, for continuously cooling said metal strip by blowing a cooling gas onto the surface of said metal strip so as to achieve a uniform temperature distribution in the width direction of said metal strip after a final cooling thereof, said gas cooler being arranged in the width direction of said metal strip at a prescribed distance from each of both surfaces of said metal strip, said gas cooler comprising a plurality of mutually independent nozzle headers for blowing said cooling gas onto the surface of said metal strip, and said plurality of nozzle headers controlling at least one of a flow rate and a flow velocity of said cooling gas in the width direction of said metal strip; and

a first tension regulator comprising at least two rolls, arranged on an entry side of said at least one cooling roll, and a second tension regulator comprising at least two rolls, arranged on the exit side of said gas cooler.

5,182,075
NUCLEAR FUSION REACTOR

Yoshitaka Gotoh, Katsuta; Shigeru Kikuchi; Tetsuo Nakazawa, both of Ibaraki; Tadahiko Miyoshi, Hitachi; Tetsuo Oyama, Takahagi; Yoshihiro Ozawa, Mito, and Shin-ichi Itoh, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 15, 1990, Ser. No. 523,403
Claims priority, application Japan, May 24, 1989, 1-128836
Int. Cl.[5] G21B *1/00*
U.S. Cl. 376—150 32 Claims



1. A nuclear fusion reactor having a vacuum vessel in which hydrogen isotope plasma or corpuscular rays is enclosed, a confining magnetic field generating coil for confining said plasma or corpuscular rays at a predetermined position in said vacuum vessel and a cooling metal base forming a wall of said vacuum vessel and having a refrigerant passage for cooling said wall, said nuclear fusion reactor also comprising:

a layer with low tritium permeability, having lower tritium permeability than that of said cooling metal base and formed on the surface of said cooling metal base on at least a surface of said cooling metal base facing said plasma or corpuscular rays enclosed;

a heat resistant and insulating fire member, with a heat resistance higher than that of said cooling metal base, for protecting and thermally shielding from irradiation of said plasma or corpuscular rays, said heat resistant and insulating fire member being formed overlying said surface of said cooling metal base facing said plasma or corpuscular rays, the heat resistant and insulator member being made of a fiber reinforced heat resistant member whose reinforcement fibers are made of a material selected from the group consisting of carbon, SiC, B and B_4C, and whose base material is made of a material selected from the group consisting of carbon, SiC, B_4C, Be_2C, SiO_2 and BeO.

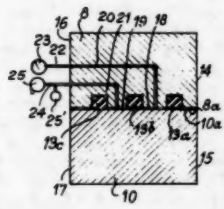
5,182,076
METHOD FOR MONITORING THE EMPLACEMENT OF A TRANSPORTABLE ELEMENT AND THE TIGHTNESS OF ITS JOINT WITH A FIXED STRUCTURE, AND THE USE OF THIS METHOD

Nicolas de Seroux, and Dominique Limouzin, both of Lyons, France, assignors to Framatome, Courbevoie, France

Filed Aug. 23, 1991, Ser. No. 749,276
Claims priority, application France, Aug. 28, 1990, 90 10725
Int. Cl.[5] G21C *17/00*
U.S. Cl. 376—250 7 Claims

1. Method for monitoring emplacement of a transportable element on an abutment surface of a fixed structure, said transportable element having an abutment surface and at least two compressible annular sealing joints arranged inside each other and protruding from said abutment surface of said transportable element, said method comprising the steps of

(a) measuring a pressure of a gas in a space lying between said sealing joints and bounded by said abutment surfaces of said transportable element and of said fixed structure, continuously during emplacement of said abutment surface of said transportable element on said abutment surface of said fixed structure so that said transportable element comes to bear on said fixed structure through said joints which undergo progressive compression during said emplacement; and

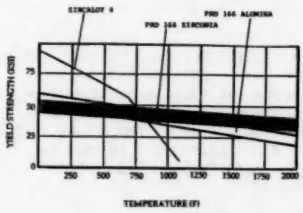


(b) comparing at least one value of the pressure measured during said emplacement with at least one predetermined value corresponding to a correct emplacement of said transportable element.

5,182,077
WATER COOLED NUCLEAR REACTOR AND FUEL ELEMENTS THEREFOR

Herbert Feinroth, Silver Spring, Md., assignor to Gamma Engineering Corporation, Rockville, Md.

Filed Apr. 15, 1991, Ser. No. 684,797
Int. Cl.[5] G21C *3/00*
U.S. Cl. 376—416 30 Claims



1. A fuel element for a water cooled nuclear reactor comprising, a cladding defining a closed waterproof gastight chamber therewithin, and nuclear fuel means disposed withins aid chamber, the major portion of said cladding being formed of a fibrous ceramic composite material an dhaving a high density ceramic coating thereon which is impermeable to fission gases, said composite material comprising a tow of ceramic fibers surrounded by a continuous matrix of ceramic oxide, said cladding being inert in high temeprature H_2O, being strong, tough, and having high thermal shock resistance and low neutron capture cross-section.

5,182,078

METAL TREATMENT

Alfonso L. Baldi, Sea Isle City, N.J., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 472,663, Jan. 30, 1990, Pat. No. 5,077,257, which is a continuation-in-part of Ser. No. 289,595, Dec. 22, 1988, Pat. No. 4,965,095, which is a continuation-in-part of Ser. No. 182,718, Apr. 18, 1988, Pat. No. 4,970,114, which is a continuation-in-part of Ser. No. 28,741, Mar. 23, 1987, Pat. No. 4,927,798, each is a continuation-in-part of Ser. No. 205,387, Jun. 10, 1988, Pat. No. 4,895,609, which is a continuation-in-part of Ser. No. 96,368, Sep. 11, 1987, Pat. No. 4,880,483, which is a continuation-in-part of Ser. No. 862,712, May 13, 1986, Pat. No. 4,871,708, which is a continuation-in-part of Ser. No. 707,656, Mar. 4, 1985, Pat. No. 4,824,482, which is a continuation-in-part of Ser. No. 685,910, Dec. 27, 1984, Pat. No. 4,820,362, which is a continuation-in-part of Ser. No. 584,538, Feb. 28, 1984, Pat. No. 4,845,139, which is a continuation-in-part of Ser. No. 538,541, Oct. 3, 1983, Pat. No. 4,830,931, which is a continuation-in-part of Ser. No. 632,016, Jul. 18, 1984, abandoned, which is a continuation-in-part of Ser. No. 571,510, Jan. 17, 1984, Pat. No. 4,537,927, which is a continuation-in-part of Ser. No. 554,441, Nov. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 488,103, Apr. 25, 1983, Pat. No. 4,615,920, which is a continuation-in-part of Ser. No. 417,214, Sep. 13, 1982, abandoned, which is a continuation-in-part of Ser. No. 281,405, Jul. 8, 1981, Pat. No. 4,708,913, which is a continuation-in-part of Ser. No. 172,671, Jul. 28, 1980, Pat. No. 4,435,481. This application Jun. 6, 1990, Ser. No. 533,879

The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.

Int. Cl.[5] B22F 7/06

U.S. Cl. 419—9 11 Claims

1. The process for production of nickel and iron aluminides which comprises pouring onto an iron foil a mixture of powdered aluminum and powdered nickel and/or iron, which mixture also contains about 1/30 to about ½ atom copper for every atom of nickel and iron, and in a suitable atmosphere heating the mixture to cause the powdered metals to interact.

5,182,079

METALLIC COMPOSITION AND PROCESSES FOR USE OF THE SAME

Jerry L. Nelson, Mt. Clemens, Mich., assignor to Nelson & Associates Research, Inc., Mt. Clemens, Mich.

Continuation-in-part of Ser. No. 553,797, Jul. 17, 1990, Pat. No. 5,055,253. This application Jul. 15, 1991, Ser. No. 729,644

Int. Cl.[5] C22C 38/42; C21D 9/00

U.S. Cl. 420—87 19 Claims

1. A metallic composition comprising at least about 92 percent by weight iron (Fe), from about 0.50 to about 5.65 percent by weight carbon (C), from about 0.090 to about 1.45 percent by weight manganese (Mn), up to about 0.030 percent by weight phosphorus (P), from about 0.030 to about 0.080 percent by weight sulfur (S), from about 1.30 to about 1.70 percent by weight chromium (Cr), from about 0.050 to about 0.80 percent by weight silicon (Si), at least about 0.20 percent by weight copper (Cu), from about 0.15 to about 0.40 percent by weight nickel (Ni) up to about 0.010 percent by weight vanadium (V), up to about 0.20 percent by weight molybdenum (Mo), less than about 0.05 percent by weight cobalt (Co), less than about 0.03 percent by weight tungsten (W), less than about 0.001 percent by weight titanium (Ti) and less than about 0.20 percent by weight aluminum (Al).

5,182,080

ADVANCED HIGH-TEMPERATURE BRAZING ALLOYS

Adrian M. Beltran, Ballston Spa, and Charles H. Kreischer, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1990, Ser. No. 633,346

Int. Cl.[5] C22C 19/70

U.S. Cl. 420—588 2 Claims

1. A cobalt base, high temperature brazing alloy consisting essentially of, by weight:

Nickel	10%;
Chromium	29%;
Tungsten	7%;
Carbon	0.1%;
Boron	2.5%;
Silicon	2.5%;
Manganese	0.6%;
Cobalt	Balance

5,182,081

PRODUCT TO BE USED IN OCCLUSIVE EPICUTANEOUS TESTING FOR THE PURPOSE OF DEMONSTRATING CONTACT ALLERGY TO FORMALDEHYDE

Kurt Hedegaard, Horsholm; Sten Albrectsen, Holte, and Jens Hansen, Allerod, all of Denmark, assignors to Kabi Pharmacia AB, Uppsala, Sweden

PCT No. PCT/SE89/00330, § 371 Date Feb. 1, 1990, § 102(e) Date Feb. 1, 1990, PCT Pub. No. WO90/00064, PCT Pub. Date Jan. 11, 1990

PCT Filed Jun. 12, 1989, Ser. No. 460,197

Claims priority, application Sweden, Jun. 28, 1988, 8802403-9

Int. Cl.[5] A61B 5/00; G01N 31/22

U.S. Cl. 422—56 3 Claims

1. A test strip comprising at least one patch thereon containing a test substance which is suitable for use in occlusive epicutaneous testing in order to detect contact allergy to formaldehyde, wherein the test substance on at least one of said at least one patch is a reversible N-formaldehyde derivative of succinimide, said derivative

(i) having been formulated in a dry vehicle together with a buffer substance that provides a pH-value within 4–10,

(ii) decomposing in an aqueous solution of pH 9 containing 0.1M of HCO_3^-/CO_3^{2-}, and a concentration of test substance of 8×10^{-4}M at a half life rate of less than 7 hours, and

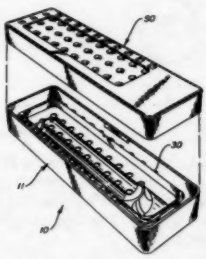
(iii) giving substantially no incidence of skin reactions of an allergic or irritative type.

5,182,082

MULTIPLE ALIQUOT DEVICE FOR DISTRIBUTING A LIQUID SOLUTION INTO A WELL

James F. Monthony, Baltimore; Dwight Livingston, Towson; Jayakumar Reuben, Fallston, and Robert C. Tite, Baltimore, all of Md., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jan. 23, 1991, Ser. No. 644,786
Int. Cl.[5] G01N 21/00
U.S. Cl. 422—57 27 Claims



1. A device for dividing a sample into aliquots without air entrapment and for retention of aliquots therein, comprising:

a sample distribution element comprising an upper surface and a lower surface substantially parallel to each other, means for containing and/or guiding said sample associated with said upper surface, and at least one well disposed between said upper and lower surfaces wherein said well comprises an upper mouth opening that forms a substantially sharp junction with said upper surface, a lower mouth opening in said lower surface, a sidewall connecting said upper mouth opening with said lower mouth opening, and a sidewall bottom surface associated with said lower mouth opening;

and an outer-base element associated with a portion of said sample distribution element comprising a bottom with an inner surface and at least one well bottom raised from said inner surface;

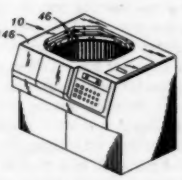
wherein said sidewall bottom surface of said well of said sample distribution element and said well bottom of said outer-base element are substantially parallel to each other and form a spaced mean stop allow the escape of air.

5,182,083

SAMPLE WHEEL FOR CHEMISTRY ANALYZERS

Stephen F. Barker, La Mirada; Samuel G. Ricchio, Fullerton; Glenn A. Benton, Hesperia, and Delbert D. Jackson, Placentia, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 13, 1989, Ser. No. 322,802
Int. Cl.[5] B65G 47/00, 47/244
U.S. Cl. 422—63 22 Claims



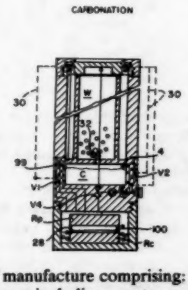
1. Apparatus comprising a body, discrete elements located in a row associated with the body, motive means for progressively moving the elements towards and from a target location relative to the body, the motive means including a motor and a cam, the motor rotating the cam, and a follower for engagement by the cam and for engagement with the body to cause the follower to move the body and associated elements respectively towards the target location during a first predetermined portion of travel of the cam, and away from the target location during the second predetermined portion of travel of the cam, wherein the cam and elements follow a predetermined travel path, the cam being rotatable about an axis and having means remote from the axis for engaging the follower such that the first predetermined portion of the travel path of the cam and elements is substantially a quarter-circular path, and the second predetermined portion of the travel path of the cam and elements is a quarter-circular path, the two quarter-circular paths constituting a semi-circular path for the cam and elements.

5,182,084

PORTABLE AUTOMATIC WATER CARBONATOR

George Piester, Essen, Fed. Rep. of Germany, assignor to The Coca-Cola Co., Atlanta, Ga.

Continuation-in-part of Ser. No. 465,644, Jan. 22, 1990, abandoned, which is a continuation of Ser. No. 108,684, Oct. 15, 1987, abandoned. This application Mar. 19, 1990, Ser. No. 495,411
Int. Cl.[5] B01J 7/00
U.S. Cl. 422—105 24 Claims



1. An article of manufacture comprising:

a) carbonator means including a water reservoir for containing a predetermined quantity of water to be carbonated by the mixing of CO_2 gas therein;

b) gas generating means including reagents for generating CO_2 gas within a gas generating chamber when the reagents chemically react, said gas generating chamber being in fluid communication with the water reservoir in said carbonator means,

said reagents including,

a fixed quantity of chemicals, said fixed quantity being selected to correspond to an amount necessary to generate enough CO_2 gas to carbonate all of said predetermined quantity of water in said water reservoir to a predetermined level, and

a separate charge of chemicals which periodically mix to generate CO_2 gas for propelling carbonated water from said carbonator means;

c) a pressure regulating chamber in fluid communication with both a gaseous head space in said water reservoir and said gas generating chamber, said pressure regulating chamber including a head space formed therein;

d) valve means for accommodating the flow of carbonated water from said carbonator means when in an open state and preventing the flow therefrom when in a clsoed state; and

e) control means responsive to the relative internal pressures between the gaseous head space in said water reservoir, the gas generating chamber and the pressure regulating chamber, for initiating or precluding the mixing of said separate charge of chemicals to initiate or stop the generation of the CO_2 gas for propelling carbonated water from said carbonator means to thereby maintain the pressure of propelled carbonated water substantially constant.

5,182,085

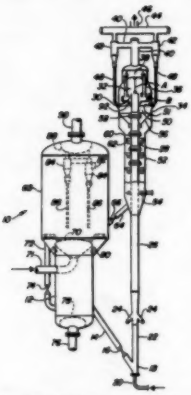
VENTED RISER APPARATUS AND METHOD

David A. Lomas, Barrington; Edward C. Haun, Glendale Heights, and Paul A. Sechrist, Des Plaines, all of Ill., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 524,525, May 17, 1990, Pat. No. 5,104,517. This application Oct. 31, 1991, Ser. No. 785,956

Int. Cl.[5] F27B *15/08*

U.S. Cl. 422—144 **7 Claims**



1. An apparatus for the fluidized catalytic cracking (FCC) of an FCC feedstock, said apparatus comprising:

(a) an upwardly directed riser conduit having an upwardly directed outlet end;

(b) a reactor vessel having an upper end surrounding said outlet end and defining an open disengagement zone wherein the top of said reactor vessel is located 5 to 12 riser diameters above said outlet end;

(c) a gas solid separation device located outside of said reactor vessel having an inlet, a gas outlet, and a solids outlet;

(d) means for collecting a mixture of gas and catalyst from said open disengagement zone of said reactor vessel into the inlet of said separation device;

(e) means for returning catalyst particles from said gas solid separation device to said reactor vessel; and

(f) means for withdrawing catalyst from the bottom of said reactor vessel and transferring catalyst to a regeneration vessel.

5,182,086

OIL VAPOR EXTRACTION SYSTEM

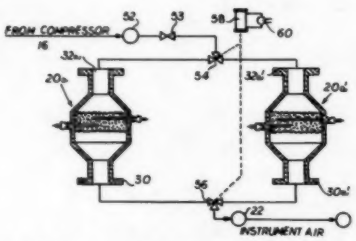
Charles A. Henderson, 29 W. 326 Helen, W. Chicago, Ill. 60185, and Terry D. Henderson, 1100 Queens Ct., Naperville, Ill. 60540

Continuation-in-part of Ser. No. 408,439, Sep. 15, 1989, abandoned, which is a continuation-in-part of Ser. No. 223,706, Jul. 22, 1988, abandoned, which is a continuation of Ser. No. 26,955, Mar. 17, 1987, abandoned, which is a division of Ser. No. 857,712, Apr. 30, 1986, abandoned. This application Jan. 2, 1991, Ser. No. 636,769

Int. Cl.[5] B01D *50/00*; F01N *3/10*

U.S. Cl. 422—171 **21 Claims**

1. A compressed air system comprising in combination: an air compressor having a compressed air outlet wherein compressed air is discharged to a delivery system coupled to downstream utilization apparatus; and a catalytic oxidation system having an inlet coupled to said compressor outlet to receive said compressed air therefrom, and comprising a treatment chamber containing a quantity of a catalytic oxidizing material for oxidizing compressor oil carried in the compressed air into carbon dioxide and water to thereby form treated compressed air having a predetermined percentage of pre-existing compressor oil removed therefrom, an outlet coupled with said delivery system for delivering said treated compressed air therethrough to said downstream utilization apparatus; and control means for periodically stopping the air flow to said



catalytic oxidation system for allowing further heat buildup therein to further enhance the catalytic reaction therein; wherein said catalytic oxidizing material comprises a high-activity catalyst effective at an operating temperature below about 500° F. (260° C.).

5,182,087

METHOD FOR MIXING TWO LIQUIDS OR LIQUID AND SOLID MATERIAL TOGETHER, AND FOR SIMULTANEOUSLY SEPARATING ANOTHER LIQUID OR SOLID FROM THE LIQUID

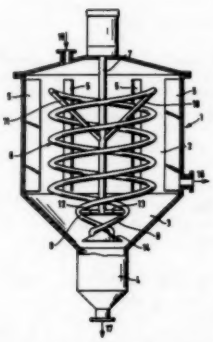
Launo L. Lilja; Valto J. Mäkitalo; Stig-Erik Hultholm, all of Pori, and Bror G. Nyman, Ulvila, all of Finland, assignors to Outokumpu Oy, Espoo, Finland

Filed Mar. 26, 1991, Ser. No. 675,437

Claims priority, application Finland, Apr. 4, 1990, 901693

Int. Cl.[5] B01F *3/00*

U.S. Cl. 422—228 **9 Claims**



1. A method for maintaining continuous mixing in a liquid throughout a reactor space and for simultaneously separating from said liquid either a second liquid or solid particles comprising: providing a reactor having three vertically superposed zones; filling said reactor with liquid and with a second liquid or a liquid and solid particles, mixing said liquid and said second liquid or said liquid and solid particles in a cylindrical reaction zone, coalescing and settling droplets of said second liquid or said solid particles in a conical settling zone below said reaction zone, and collecting said droplets or solid particles in a collecting zone below said settling zone, homogeneously mixing said liquid throughout said reaction and settling zones by creating a vertical circulation in said reactor by means of a helical impeller and baffles at rims of the reactor for causing the liquid to circulate downwards in a middle portion

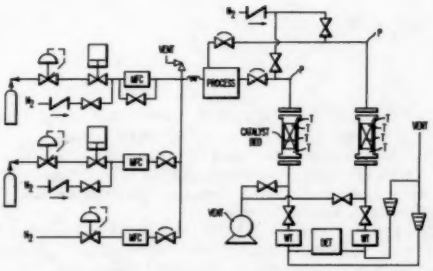
of the reactor and to circulate upwards near said rims of the reactor, and preventing the return of liquid or solid particles from the collecting zone into said circulation by providing a protective conical deflector at a bottom end of said helical impeller.

5,182,088

REMOVAL OF GASEOUS HYDRIDES

Paul Leondaridis, Paris, France; Albert S. Vendel, Chicago, Ill., and Tarranum Akthar, Chicago, Ill., assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Sep. 7, 1990, Ser. No. 579,316
Int. Cl.[5] C01B *3/50*
U.S. Cl. 423—210 14 Claims



1. A method for removing gaseous hydrides from a carrier gas stream, which comprises contacting said gas stream with a metallic oxide composition consisting essentially of cupric oxide and from 0.1 to 10% by weight, based on the total weight of the composition, of one or more compounds selected from the group consisting of AgO, HgO and CdO; and wherein said gaseous hydride is selected form the group consisting of silane, disilane, trisilane, germane, arsine, phosphine and diborane.

5,182,089

CHEMISORPTIVE METAL ALLOY AND METHOD OF USING THE SAME

Otto Bernauer, Moers, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 20, 1991, Ser. No. 658,034
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1990, 4005695
Int. Cl.[5] C01B *7/07*
U.S. Cl. 423—219 5 Claims

1. A method of purifying a reactive gas comprising one or both of the group consisting of chlorine and hydrogen chloride, containing one or more impurities selected from the group consisting of hydrogen, oxygen, argon, nitrogen, carbon monoxide and carbon dioxide, comprising:

conducting said impurities containing reactive gas through a bed of pulverized metal alloy and removing said impurities from said gas by chemisorption on said alloy;

said alloy comprising from about 30 to about 70% by weight of at least one of Ti and Zr; and

from about 70 to about 30% by weight of Cu.

5,182,090

SYNTHESIS OF LARGE CRYSTAL SIZE ZSM-5

Francis G. Dwyer, West Chester, Pa.; Pochen Chu, West Deptford, N.J., and William E. Cormier, Jr., Ellicott City, Md., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation of Ser. No. 641,325, Nov. 15, 1991, abandoned, which is a continuation of Ser. No. 184,651, Apr. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 782,186, Sep. 30, 1985, abandoned, which is a continuation of Ser. No. 429,361, Sep. 30, 1982, abandoned, which is a division of Ser. No. 289,435, Aug. 3, 1981, abandoned, which is a continuation-in-part of Ser. No. 926,472, Jul. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 784,497, Apr. 4, 1977, abandoned, said Ser. No. 184,651, is a continuation-in-part of Ser. No. 906,601, Sep. 10, 1986, abandoned, which is a continuation of Ser. No. 720,915, Apr. 8, 1985, which is a continuation-in-part of Ser. No. 504,114, Jun. 14, 1983, abandoned, which is a division of Ser. No. 192,660, Oct. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 82,825, Oct. 9, 1979, abandoned, said Ser. No. 184,651, is a continuation-in-part of Ser. No. 714,070, Mar. 21, 1985, abandoned, which is a continuation of Ser. No. 228,834, Jan. 27, 1981, abandoned, which is a continuation of Ser. No. 47,535, Jun. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 304,725, Sep. 23, 1981, Pat. No. 4,375,458, which is a division of Ser. No. 949,461, Oct. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 835,369, Aug. 17, 1977, abandoned. This application Feb. 19, 1992, Ser. No. 839,731
The portion of the term of this patent subsequent to Mar. 1, 2000, has been disclaimed.
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—704 1 Claim

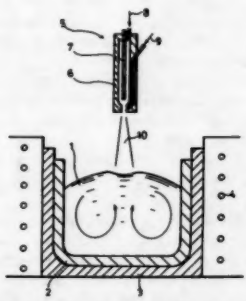
1. A method for preparing ZSM-5, said method comprising forming an aqueous reaction mixture comprising sources of silica, alumina, tetrapropylammonium cations and tetramethylammonium cations, wherein said reaction mixture includes a source of deliberately added alumina which is not an aluminum containing impurity from the other reactants and/or equipment used, and maintaining said reaction mixture under sufficient crystallization conditions until crystals of said ZSM-5 are formed.

5,182,091

METHOD AND APPARATUS FOR PURIFYING SILICON

Noriyoshi Yuge; Hiroyuki Baba, and Fukuo Aratani, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed May 29, 1991, Ser. No. 706,990
Claims priority, application Japan, May 30, 1990, 2-138266; May 30, 1990, 2-138268; May 9, 1991, 3-104342
Int. Cl.[5] C01B *33/02*
U.S. Cl. 423—348 3 Claims



1. A method for purifying silicon which comprises directing a plasma jet of an inert gas toward the surface of molten silicon held in a container lined with silica or a silica-based refractory

and stirring said molten silicon, said inert gas being mixed with 0.1–10 vol % steam.

5,182,092

HYDROXYLAMMONIUM NITRATE PROCESS

Thomas Liggett, Indian Head, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1976, Ser. No. 662,647
Int. Cl.[5] C01B *21/20*
U.S. Cl. 423—387 **7 Claims**

1. A process for producing hydroxylammonium nitrate, which comprises the steps of:

reacting a hydroxylammonium salt selected from the group consisting of hydroxylammonium sulfate, hydroxylammonium chloride, and hydroxylammonium acid sulfate with an aqueous solution of a nitrate salt selected from the group consisting of sodium nitrate, potassium nitrate, and calcium nitrate, and an organic solvent selected from the group consisting of n-butyl alcohol, sec-butyl alcohol, isobutyl alcohol and mixtures thereof and forming therein hydroxylammonium nitrate and mixtures thereof;

purifying the hydroxylammonium nitrate containing organic solvent solution; and

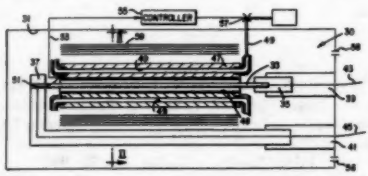
recovering the hydroxylammonium nitrate salt from the organic solvent.

5,182,093

DIAMOND DEPOSITION CELL

Gordon L. Cann, Laguna Beach, Calif., assignor to Celestech, Inc., Irvine, Calif.

Filed Jan. 8, 1990, Ser. No. 462,496
Int. Cl.[5] C01B *31/00*
U.S. Cl. 423—446 **32 Claims**



1. A method for depositing diamond on a surface of a substrate comprising the steps of:

positioning said surface of said substrate within a preselected distance from the surface of a carbon containing heater element such that the gap between said surfaces is less than about 10 times the mean free path of hydrogen atoms in said gap at all points on said surface of said substrate on which diamond is to be deposited;

maintaining the portion of said surface of said heater element which is within said preselected distance from said surface of said substrate at a substantially uniform, selected, relatively high temperature;

introducing a hydrogen containing gas at a preselected pressure in the gap between said substrate and said surface; and

maintaining the surface of said substrate proximate said heater element surface at a substantially uniform selected, relatively low temperature such that the gas at the surface of said substrate is slightly supersaturated with carbon and the emission or return rate for carbon atoms from said surface of said heater element is higher than from said surface of said substrate, such that diamond is deposited on said substrate.

5,182,094

PROCESS FOR THE PREPARATION OF POLYALUMINUM COMPOUNDS

Magnus Kvant, Niederroedern, France, and Kjell Stendahl, Helsingborg, Sweden, assignors to Kemira Kemi Aktiebolag, Helsingborg, Sweden

Filed Feb. 13, 1990, Ser. No. 479,256
Claims priority, application Sweden, Feb. 13, 1989, 8900478-2
Int. Cl.[5] C01F *7/56*
U.S. Cl. 423—462 **10 Claims**

1. A process for preparing polyaluminum hydroxy chloride complexes having the general formula $Al(OH)_xCl_y$ in solution or solid form comprising reacting aluminum chloride in solution having an aluminum content of 5 to 12% with aluminum hydroxide or aluminum hydroxide hydrates in a stoichiometric ratio so that the process is conducted in the absence of an excess of aluminum hydroxide at a temperature of 120°–170° C. at an elevated pressure up to 7 atmospheres for 1.5–5 hours whereby the ratio $AlCl_3$:$(OH)_3$ is adjusted so that the ratio OH:Al in the resulting compound $Al(OH)_xCl_y$ is 0.5–2.5 and the aluminum content is 5 to 9.5%.

5,182,095

METHOD FOR PROCESSING RESIDUES FROM THE DISTILLATION OF CHLOROSILANES

Klaus Ruff, Troisdorf; Bernhard Falk, Rheinfelden-Minseln, and Detlef Liesching, Troisdorf-Sieglar, all of Fed. Rep. of Germany, assignors to Hüls Troisdorf Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 282,452, Dec. 9, 1988, abandoned. This application Jul. 12, 1991, Ser. No. 730,035
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742614
Int. Cl.[5] C01B *33/00*; A64D *3/00*
U.S. Cl. 423—659 **5 Claims**

1. A method of processing a residue which is produced as bottom product after the distillation of chlorosilane from the hydrochlorination or chlorination of silicon, consisting essentially of: subjecting the residue to a hydrolysis with steam and releasing hydrogen chloride from the residue; and then contacting the residue with a mixture of nitrogen and oxygen at a temperature of 60° to 1400° C.

5,182,096

COMPOUND APPLICABLE AS CARRIER FOR SUBSTANCES OR ACTIVE CHEMICAL, PHYSICAL OR BIOLOGICAL PRODUCTS

Abelardo A. Portas, and Graciela I. O de Portas, both of Arcos 2757. 1E., 1428 Buenos Aires, Argentina

Filed Nov. 9, 1990, Ser. No. 611,190
Claims priority, application Argentina, Nov. 16, 1989, 315456
Int. Cl.[5] A01N *25/06*; B05D *1/12*; A61K *47/04, 47/18*
U.S. Cl. 424—45 **10 Claims**

1. In combination,

a first component selected from the group consisting of ammonia, monoalkylamine aliphatic C1–C4 distinct from isopropylamine, and dialkylamine aliphatic C1–C2;

a second component selected from the group consisting of acetic acid and sulphur dioxide; active substances to be carried and

a propelling agent for propelling each of said components into contact with each other to generate airborne particles of small size as carriers for said active substances.

5,182,097

FORMULATIONS FOR DELIVERY OF DRUGS BY METERED DOSE INHALERS WITH REDUCED OR NO CHLOROFLUOROCARBON CONTENT

Peter R. Byron, and Richard N. Dalby, both of Richmond, Va., assignors to Virginia Commonwealth University, Richmond, Va.

Filed Feb. 14, 1991, Ser. No. 655,668
Int. Cl.[5] A61K *9/12, 31/135;* C07C *19/08*
U.S. Cl. 424—45 6 Claims

3. An aerosol formulation for use in delivering medication to a patient via an inhalation device, comprising:

a propellant blend comprising at least two different hydrocarbon compounds and having a vapor pressure ranging between 17 and 108 pounds per square inch gauge, said propellant blend comprising at least 90% by weight of said aerosol formulation;

an inhalable medicant dispersed or dissolved in said propellant blend, said vapor pressure of said propellant blend being sufficient to produce a fine mist of said inhalable medicant, said inhalable medicant having a particle size less than 100 microns in diameter, said inhalable medicant comprising no more than 5% by weight of said aerosol formulation; and

an amount of oleic acid for aiding in dispersing said inhalable medicant in said propellant blend, said amount comprising no more than 0.2% weight in volume of said aerosol formulation.

5,182,098

TERPOLYMER HAIR FIXATIVES, AQUEOUS SOLUTION PROCESS FOR MAKING SAME AND WATER-BASED HAIR SPRAY FORMULATIONS WHICH MEET VOC STANDARDS

Stephen L. Kopolow, Plainsboro; Mohammed Tazi, Wayne, and Edward W. Walls, Jr., Cranford, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Oct. 9, 1991, Ser. No. 773,795
Int. Cl.[5] A61K *7/11*
U.S. Cl. 424—47 9 Claims

1. A terpolymer hair fixative consisting essentially of about 5 to 20% by weight of vinyl caprolactam, about 65 to 90% by weight of vinyl pyrrolidone and about 5 to 15% by weight of methylacryloamidopropyl trimethylammonium chloride.

5,182,099

PREPARATION FOR PREVENTION OF EMISSION OF MERCURY FROM AMALGAM FILLINGS AND METHOD

Eston Jönsson, and Roland Waern, both of Värnamo, Sweden, assignors to Swedima, Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 752,458, Aug. 27, 1991, abandoned. This application Aug. 27, 1991, Ser. No. 750,474
Int. Cl.[5] A61K *7/16, 9/68, 31/095*
U.S. Cl. 424—49 2 Claims

1. A method of preventing or decreasing the emission or mercury vapor in the mouth from a mercury amalgam filling in a tooth in the mouth of a host, comprising contacting the amalgam filling with an oral composition containing sulfur in an amount that is effective for reducing or eliminating the emission of mercury or mercury vapor from the mercury-containing dental amalgam in the mouth of said host.

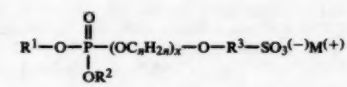
5,182,100

PLAQUE-INHIBITING ORAL AND DENTAL CARE PREPARATIONS

Hans-Juregen Klueppel, Duesseldorf, and Bernd Fabry, Korschenbroich, both of Fed. Rep. of Germany, assignors to Henkel Kommandigesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP90/01290, § 371 Date Feb. 14, 1992, § 102(e) Date Feb. 14, 1992, PCT Pub. No. WO91/02510, PCT Pub. Date Mar. 7, 1991
PCT Filed Aug. 7, 1990, Ser. No. 829,085
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1989, 3927011
Int. Cl.[5] A61K *7/16*
U.S. Cl. 424—49 6 Claims

1. An oral or dental care preparation, wherein the improvement comprises the presence in the preparation of a plaque-inhibiting effective amount of at least one surface-active sulfophosphoric acid ester salt corresponding to general formula I:



in which R^1 represents hydrogen or a cation $M^{(+)}$; R^2 represents hydrogen, a cation $M^{(+)}$, or a group $(OC_nH_{2n})_x—O—R^3—SO_3^{(-)}M^{(+)}$; R^3 is an alkylene, hydroxylakylene or alkenylene group containing 8 to 22 carbon atoms; n=2 or 3; x=0 or a number of 1 to 30; and $M^{(+)}$ is an alkali metal, ammonium, mono-, di- or trialkaneolammonium ion containing 2 to 4 carbon atoms in the alkanol groups.

5,182,101

ANTI-PLAQUE TOOTHPASTE

Peter Wuelknitz, Langenfeld-Berghausen; Rudolf Lehmann, Leichlingen, and Hans-Juergen Klueppel, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

PCT No. PCT/EP90/01345, § 371 Date Feb. 20, 1992, § 102(e) Date Feb. 20, 1992, PCT Pub. No. WO91/02511, PCT Pub. Date Mar. 7, 1991
PCT Filed Aug. 16, 1990, Ser. No. 835,965
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927982
Int. Cl.[5] A61K *7/16, 7/22*
U.S. Cl. 424—54 16 Claims

1. A toothpaste in the form of an aqueous dispersion containing 10.0 to 60.0% by weight of polishes, 2.0 to 20.0% by weight of humectants, 0.5 to 5.0% by weight of water-soluble viscosity regulators, 0.05 to 0.5% by weight of antimicrobial biguanides, and 1.0 to 5.0% by weight of other additives from the group of surfactants, flavoring oils, and sweeteners, wherein the improvement is that calcium carbonate is predominantly present as the polish, non-ionic polysaccharide derivatives are present as the viscosity regulators, and a cationic surfactant containing a linear C_{12}-alkyl group and one or two tertiary amino groups or quaternary ammonium groups is present as the surfactant, a nonionic solubilizer for the flavoring oil optionally being present.

5,182,102

ANTI-GLAUCOMA COMPOSITIONS

Louis DeSantis, Jr., and Rajni Jani, both of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Jul. 12, 1991, Ser. No. 728,920
Int. Cl.[5] A61K *9/10, 47/32, 31/135, 31/14*
U.S. Cl. 424—78.1 6 Claims

1. A topical ophthalmic composition for the treatment of glaucoma and ocular hypertensions, comprising: about 0.25

wt% betaxolol; between about 1.5 and about 3.0 wt% carbachol; between about 0.05 and about 8.0 wt% of an anionic mucomimetic polymer; and about 0.05 and about 10.0 wt% of a finely divided cation exchange resin.

5,182,103

MAGNESIUM ALUMINOMETASILICATE COATED COMPOSITE POWDER AND USE THEREOF

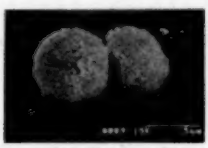
Toshihiko Nakane, Yokohama; Masumi Koishi, Sagamihara; Hiroshi Fukui, Yokohama; Yutaka Okunuki, Yokohama; Yoshio Yahata, Yokohama; Shigenori Kumagai, Yokohama; Hiroyuki Yokoyama, Yokohama; Eiichiro Yagi, Yokohama; Minoru Fukuda, Yokohama; Tadao Ohta, Yokohama; Fujihiro Kanda, Yokohama; Kazuhisa Ohno, Yokohama; Toshihide Ebisawa, Yokohama; Tomiyuki Nanba, Yokohama; Susumu Takada, Yokohama; Masato Hatao, Yokohama; Masaru Suetsugu, Yokohama; Toshihiro Tanaka, Yokohama, and Osamu Moro, Yokohama, all of Japan, assignors to Shiseido Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 357,616, May 24, 1989, abandoned, and a continuation of Ser. No. 939,379, Dec. 8, 1986, abandoned. This application Jun. 6, 1989, Ser. No. 361,880

Claims priority, application Japan, Dec. 9, 1985, 60-276505; Jul. 22, 1986, 61-172499; Nov. 21, 1986, 61-278374; Jun. 7, 1988, 63-138311

Int. Cl.[5] A61K *31/78*

U.S. Cl. 424—78.03 **13 Claims**



1. A composite powder which comprises magnesium aluminometasilicate and optionally at least one other powder selected from the group consisting of organic powders of polyamide resin, polyolefin resin, polystyrene, polyester resin, acrylic resin, epoxy resin, fluorine type resin, silicone type resin, phenol resin, vinyl resin, vinylidene resin, polyurethane resin, natural rubber, synthetic rubber, chitin, chitosan, fibroin, keratin, and cellulose, and inorganic powders of talc, kaolin, mica, titanium dioxide, zinc white, zirconium oxide, anhydrous silicic acid, barium sulfate, iron oxide, mica, aluminum hydroxide chloride, calcium phosphate, and calcium secondary phosphate, coated on a surface of a core powder, said composite powder being produced by dry mixing the core powder and magnesium aluminometasilicate and the optional powder.

5,182,104

TOPICAL VIRUCIDAL COMPOSITION FOR TREATMENT OF MUCOCUTANEOUS TISSUE

Stanley Marcus, 1400 E. Federal Way, Salt Lake City, Utah 84102, and Wendy Y. Kim, 968 E. Green Oaks Dr., Bountiful, Utah 84010

Filed Jul. 16, 1991, Ser. No. 730,612

Int. Cl.[5] A01N *31/14*; A61K *31/075*

U.S. Cl. 424—78.07 **8 Claims**

1. A non-cosmetic virucidal composition for medicinally therapeutic and prophylactic topical treatment of mucocutaneous oral tissues the active ingredients of which, in combination, consist of:

a polyethylene glycol polymer with a molecular weight of 968 present in concentrations between two and five percent by weight; and

a combination of fat soluble vitamins present in an amount between 0.2 and one percent by weight.

5,182,105

BATHING COMPOSITION

Noboru Takata; Junko Arai, and Hidenori Yorozu, all of Tochigi, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 426,257, Oct. 25, 1989, abandoned. This application Aug. 27, 1991, Ser. No. 754,260

Claims priority, application Japan, Oct. 25, 1988, 63-268889

Int. Cl.[5] A61K *31/74*

U.S. Cl. 424—78.02 **9 Claims**

1. A bathing composition consisting essentially of:

(1) from 0.5 to 50 parts by weight per 100 parts by weight of the bathing composition of an oily component selected from the group consisting of fats and oils, waxes, hydrocarbons, higher fatty acids, higher alcohols, esters, essential oils and silicone oils,

(2) from 5 to 100 parts by weight per 100 parts by weight of the oily component (1) of a nonionic surfactant selected from the group consisting of glycerol fatty acid esters, propylene glycol fatty acid esters, sorbitan fatty acid esters, polyoxyethylene sorbitan fatty acid esters, tetraoleic acid polyoxyethylene sorbitol, polyoxyethylene alkyl ethers, polyoxyethylene polyoxypropylene glycol, polyoxyethylene polyoxypropylene alkyl ethers, polyethylene glycol fatty acid esters, polyoxyethylene castor oil, polyoxyethylene hardened castor oil and polyglycerol fatty acid esters, and

(3) from 0.01 to 20 parts by weight per 100 parts by weight of the bathing composition of a cationic polymer selected from the group consisting of cationic cellulose, cationic dextran, cationic dextrin, chitosan, cationic vinylpyrrolidone polymer, N,N-dimethyl-3,5-methylenepiperidinium chloride polymer and distearyldimethylammonium chloride polymer.

5,182,106

METHOD FOR TREATING HYPOTHERMIA

Craig K. Mezrow, New York, N.Y.; Robert L. Hunter, Tucker, and Carol E. Bennett, Decatur, both of Ga., assignors to Emory University, Atlanta, Ga.

Continuation-in-part of Ser. No. 522,206, May 11, 1990, Pat. No. 5,078,995, which is a continuation of Ser. No. 403,017, Sep. 5, 1989, abandoned, which is a continuation of Ser. No. 303,791, Jan. 30, 1989, abandoned, which is a continuation of Ser. No. 45,459, May 7, 1987, Pat. No. 4,801,452, which is a continuation-in-part of Ser. No. 43,888, Apr. 29, 1987, abandoned, which is a continuation of Ser. No. 863,582, May 15, 1986, abandoned. This application May 1, 1991, Ser. No. 694,283

Int. Cl.[5] A61K *31/745*

U.S. Cl. 424—78.31 **24 Claims**

1. A method for treating a human or animal that is hypothermic comprising the step of administering to the animal or human that is hypothermic an effective amount of a surface active copolymer with the following general formula:

$$HO(C_2H_4O)_a(C_3H_6O)_b(C_2H_4O)_aH$$

wherein a is an integer such that the hydrophobe represented by (C_3H_6O) has a molecular weight of approximately 950 to 4000 daltons, and b is an integer such that the hydrophile portion represented by (C_2H_4O) constitutes approximately 50% to 90% by weight of the copolymer.

5,182,107

TRANSFERRIN RECEPTOR SPECIFIC ANTIBODY-NEUROPHARMACEUTICAL OR DIAGNOSTIC AGENT CONJUGATES

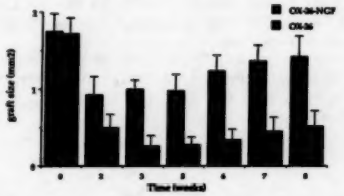
Phillip M. Friden, Bedford, Mass., assignor to Alkermes, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 404,089, Sep. 7, 1989. This application Mar. 6, 1992, Ser. No. 846,830

The portion of the term of this patent subsequent to Oct. 13, 2009, has been disclaimed.

Int. Cl.[5] A61K *39/44, 37/36;* C07K *17/02, 15/28*

U.S. Cl. 424—85.91 27 Claims



1. A method for delivering a therapeutically effective amount of nerve growth factor across the blood brain barrier of a mammal comprising administering antibody-nerve growth factor conjugate to the mammal under conditions whereby said conjugate binds to transferrin receptors on brain capillary endothelial cells and nerve growth factor is transported across the blood brain barrier of the mammal in a pharmaceutical active form and in a therapeutically effective amount.

5,182,108

Patent Not Issued For This Number

5,182,109

VACCINE PREPARATION COMPRISING A BACTERIAL TOXIN ADJUVANT

Shinichi Tamura, Kanagawa; Takeshi Kurata, Tokyo; Chikara Aizawa, and Takashi Nagamine, both of Kanagawa, all of Japan, assignors to National Institute of Health and The Kitasato Institute, both of Tokyo, Japan

Filed Apr. 10, 1989, Ser. No. 335,678

Claims priority, application Japan, Apr. 8, 1988, 63-86693; Jan. 13, 1989, 1-6759

Int. Cl.[5] A61K *39/02, 39/12*

U.S. Cl. 424—92 7 Claims

1. A vaccine preparation comprising in combination a vaccine and a toxin or subunit thereof as an effective component, said toxin being a bacterial toxin selected from the group consisting of cholera toxin, staphylococcal α-hemolysin, staphylococcal α-hemolysin, vibrio thermostable direct hemolysin, pertussis toxin and *E. coli* heat-labile toxin, the ratio of vaccine to toxin or subunit thereof being 1.00001–1:10,000 (w/v).

5,182,110

NATURAL EXTRACT BASED HAIR RESHAPING COMPOSITION

Vaclav Soukup, Rua Adelia, No. 140 - Apt. No. 302, Ilha do Governador, Rio de Janeiro, Brazil

Filed Aug. 29, 1989, Ser. No. 399,915

Int. Cl.[5] A61K *35/78*

U.S. Cl. 424—195.1 13 Claims

1. A composition for shaping hair, comprising:

Caesalpinea tinctoria pod extract, a source of cupric ions, and a source of ammonium chloride ions.

5,182,111

IN VIVO DELIVERY OF ACTIVE FACTORS BY CO-CULTURED CELL IMPLANTS

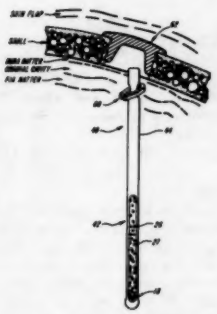
Patrick Aebischer, Barrington, and Shelley R. Winn, Providence, both of R.I., assignors to Boston University Research Foundation, Providence, R.I.

Continuation-in-part of Ser. No. 369,296, Jun. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 121,626, Nov. 17, 1987, Pat. No. 4,892,538. This application Jun. 28, 1991, Ser. No. 722,894

The portion of the term of this patent subsequent to Apr. 21, 2009, has been disclaimed.

Int. Cl.[5] A61F *2/00;* A61K *9/22;* C12N *11/02*

U.S. Cl. 424—424 15 Claims



1. A cell culture device for implantation within a subject for the delivery of an active factor to said subject, said device comprising:

a semipermeable membrane permitting the diffusion of an active factor therethrough, while excluding agents present at the site of implantation which are detrimental to cells;

at least one specific active factor-secreting cell disposed within the membrane, said active factor-secreting cell being isolated from a first tissue or cell line; and

at least one specific augmentary substance-producing cell disposed within said membrane, said augmentary substance being a molecule which induces the active factor-producing cell to produce active factor, said augmentary substance-secreting cell being isolated from a second tissue or cell line different from said first tissue or cell line, and secreting an augmentary substance that is different from said active factor and that stimulates aid active factor-producing cell to secrete active factor.

5,182,112

ANTIDIARRHEAL COMPOSITIONS CONTAINING LAPERAMIDE HYDROCHLORIDE AND A SACCHARIDE

Toshiaki Kurazumi, Narita; Hiroyuki Mizuno, Chiba; Katsumi Imamori, Chiba, and Akira Iwasa, Chiba, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1991, Ser. No. 780,931

Claims priority, application Japan, Oct. 24, 1990, 2-286458

Int. Cl.[5] A61K *31/445, 9/14*

U.S. Cl. 424—439 12 Claims

1. An antidiarrheal composition, comprising loperamide hydrochloride and a saccharide selected from the group consisting of sucrose, fructose, glucose, sorbitol, xylitol, mannitol, and mixtures thereof, said saccharide being present in an amount of from 9 to about 98 wt. % of said composition and from 3,000 times to 20,000 times the weight of said loperamide hydrochloride.

5,182,113

FACTOR XA INIBITOR FROM LEECH AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Meir Rigbi, Jerusalem, Israel, and Craig M. Jackson, Grosse Pointe Farms, Mich., assignors to Bio-Technology General Corp., New York, N.Y.

Filed Jun. 23, 1989, Ser. No. 370,601
Claims priority, application Israel, Jun. 24, 1988, 86856
Int. Cl.[5] A61K *35/62*
U.S. Cl. 424—537 **9 Claims**

1. A protein isolated from the medicinal leech *Hirudo medicinalis* which specifically inhibits bovine Factor Xa but does not inhibit bovine thrombin and has a molecular weight in the range of 10-30 kD.

5,182,114

SUGAR COMPOSITIONS WITH MOLASSES-CONTAINING FRACTION OF CANE SUGAR AS A SOURCE OF FLUORIDE ION

Eric Blaser, Toronto, Canada, and Albert Zumbé, Neuchatel, Switzerland, assignors to Jacobs Suchard AG, Zurich, Switzerland

Filed Nov. 20, 1990, Ser. No. 615,842
Int. Cl.[5] A01N *59/10*
U.S. Cl. 424—673 **14 Claims**

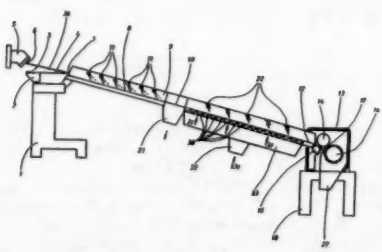
1. Method of making a sugar composition having a content of fluoride ion in the range about 2 to about 10 ppm comprising blending a molasses-containing fraction of cane sugar that is naturally superabundant in fluoride ion as compared with said content with a starting material sugar composition. naturally deficient in fluoride ion as compared with said content to obtain a blend having said content.

5,182,115

DEVICE FOR COOLING, DRYING AND GRANULATING STRANDS

Alfred Nogossek, Würzburg, and Jürgen Keilert, Kleinwallstadt, both of Fed. Rep. of Germany, assignors to Automatik Apparate-Maschinenbau GmbH, Fed. Rep. of Germany

PCT No. PCT/EP90/00025, § 371 Date Aug. 14, 1991, § 102(e) Date Aug. 14, 1991, PCT Pub. No. WO90/07408, PCT Pub. Date Jul. 12, 1990
PCT Filed Jan. 5, 1990, Ser. No. 720,441
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1989, 3900250
Int. Cl.[5] B29B *9/00*; B29C *47/00*
U.S. Cl. 425—71 **20 Claims**



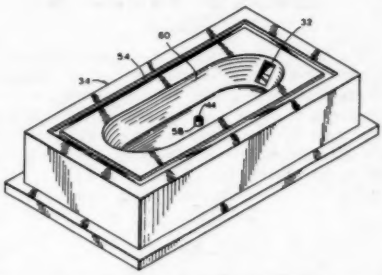
1. A device for cooling, drying, and granulating molten strands issuing from nozzles, said device comprising an outlet channel having an upstream end, a downstream end and a bottom extending from said upstream end to said downstream end, the upstream end of which is located below the nozzles, means for generating a current of cooling liquid over the outlet channel, and a granulator arranged downstream of the outlet channel, said channel including a dehydrating section that is arranged upstream of the granulator and in which the strands rest on a support provided with orifices for providing unrestricted passage of the cooling liquid, the outlet channel further including a region following the dehydrating section, said region being provided with inlet nozzles that inject a current of fluid upward through said outlet channel, said inlet nozzles being so close together and arranged over such a length in said bottom of said outlet channel so that the strands are guided with respect to the bottom virtually without friction along the outlet channel and into the granulator with a degree of dehydration that enables immediate further processing.

5,182,116

COMBINATION MOLDED ARTICLE WITH BRACKETS AND MOLD FOR MANUFACTURING SAME

Karl G. Ohaus, Chatham, N.J., assignor to American Standard Inc., New York, N.Y.

Division of Ser. No. 467,384, Jan. 19, 1990, Pat. No. 5,139,833. This application Oct. 18, 1991, Ser. No. 779,464
Int. Cl.[5] B29C *45/14, 45/40*
U.S. Cl. 425—125 **4 Claims**



1. In combination, an article to be molded and a mold for manufacturing a molded article; said article to be molded including a rigid shell having a finish side and a non-finish side, and bracket means supported on the non-finish side for attaching an object thereto; said mold including a mold receptor having a face for receiving said rigid shell and defining a first void between said non-finish side of said rigid shell and said receptor face, said receptor face having a recessed portion therein shaped and sized to receive said bracket means therein and defining a second void between said bracket means and said receptor face, said first and second voids receiving a polymeric material therein to provide a rigid coating covering the non-finish side of said shell and said bracket means, said coating distributing the weight of an object to be attached to the bracket means over the adjacent coated non-finish side of the rigid shell wherein said recessed portion has a positive draft angle to facilitate removal of the molded product.

5,182,117

HEATING AND COOLING UNIT

Koichi Ozawa, Susono; Hajime Abe, Zama, and Yutaka Owashi, Numazu, all of Japan, assignors to Toshiba Machine Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1991, Ser. No. 691,077
Claims priority, application Japan, Apr. 26, 1990, 2-108867; Apr. 26, 1990, 2-108868; Apr. 26, 1990, 2-108869
Int. Cl.[5] B29C *33/02, 35/02, 43/52, 45/73*
U.S. Cl. 425—144 **6 Claims**

1. A heating and cooling unit devised capable of selectively heating or cooling a set of dies by introducing a thermal medium into an in-die fluid path formed for said dies, comprising:
thermal medium storage means to contain the thermal medium therein;
first pump means to suck up the thermal medium from said thermal storage means, and discharge thereof;
a first thermal medium path pipe which delivers there-

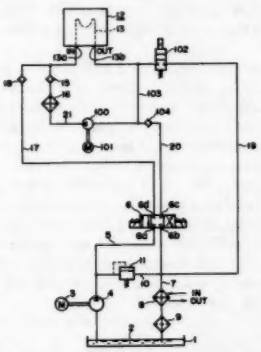
through the thermal medium out from said first pump means;

flow direction changeover valve means with first, second, third, and fourth ports, which in a standby mode preceding a die set heating mode, and wherein said first thermal medium path pipe is coupled to said first port, delivers to said second port the thermal medium discharged from said first pump means, with said first and second ports held in fluid communication with each other, in the die set heating mode, delivers to said third port the thermal medium discharged from said first pump means, with said first and third ports kept in fluid communication with each other, and in a die set cooling mode, delivers to said fourth port the thermal medium discharged from said first pump means, with said first and fourth ports maintained in fluid communication with each other;

a first thermal medium return pipe connected to said second port of said flow direction changeover valve to return the thermal medium to said thermal medium storage means;

cooling means installed on said first thermal medium return pipe to cool the thermal medium prior to return to said thermal medium storage means;

a second thermal medium path pipe coupled to said third port of said flow direction changeover valve means to deliver therethrough the thermal medium from said flow direction changeover valve means;



second pump means coupled to said flow direction changeover valve means via said second thermal medium path pipe, and which in the heating mode, sucks up and discharges the thermal medium from said flow direction changeover valve means;

a third thermal medium path pipe delivering the thermal medium out from said second pump means into the in-die fluid path of said dies;

first check valve means installed on said third thermal medium path pipe to prevent a flow of the thermal medium from said dies;

heating means installed on said third thermal medium path pipe extending between said first check valve means and said second pump means;

a fourth thermal medium path pipe to couple together said fourth port of said flow direction changeover valve means, and the in-die fluid path of said dies;

second check valve means installed on said fourth thermal medium path pipe to prevent a flow of the thermal medium from said dies;

a second thermal medium return pipe coupled to said first thermal medium return pipe to deliver therethrough the thermal medium out from the in-die fluid path of said dies;

opening and closing switching means installed on said second thermal medium return pipe to prevent a flow of the thermal medium in the heating mode with a closing cycle on, and release a flow of the thermal medium in the cooling mode with an opening cycle on;

a fifth thermal medium path pipe to couple said second thermal medium return pipe running between said in-die fluid path of said dies, and said opening and closing switching means to the inlet of said second pump means provided in said second thermal medium path pipe; and

control means to control in the die set heating mode said flow direction changeover valve means, second pump means, and opening and closing switching means in a manner to set up a thermal medium circulating circuit with said second pump means, said heating means, said first check valve means, said in-die fluid path of said dies, and said fifth thermal medium path pipe connected together in a heating mode.

5,182,118

PLASTICIZING APPARATUS FOR USE IN AN INJECTION MOLDING MACHINE

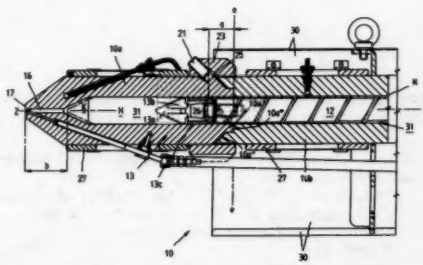
Karl Hehl, Arthur-Hehl-Str. 32, D-7298 Lossburg 1, Fed. Rep. of Germany

Filed Oct. 10, 1991, Ser. No. 774,211

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1990, 4034784; Feb. 23, 1991, 4105727

Int. Cl.[5] B29C *45/17, 45/23*

U.S. Cl. 425—192 R **10 Claims**



1. In a plasticizing apparatus for use in an injection molding machine, which apparatus comprises

a plasticizing cylinder formed with at least part of a central discharge passage and with an inside peripheral surface, which defines a cylindrical plasticizing chamber having a conical forward portion merging into said discharge passage;

a feed screw, which has forward and rear ends and is disposed in said plasticizing chamber and mounted to be rotatable and axially movable and rotatable to feed plasticizing plastic material from said rear end to said forward end; and

a backflow-preventing valve, which is mounted on said feed screw at its forward end and defines in said plasticizing chamber a low-pressure space behind said valve and a high-pressure space, which is in front of said valve and adapted to receive and accumulate said plasticized plastic material fed by said feed screw;

said feed screw being adapted to axially yield rearwardly to said plasticized plastic material accumulating in said high-pressure space and to assume a plurality of rear initial positions and operable to perform from any of said rear initial positions an axial discharge stroke for discharging said plasticized plastic material from said high-pressure space through said discharge passage;

said backflow-preventing valve being arranged to seal said high-pressure and low-pressure spaces from each other throughout said discharge stroke;

the improvement wherein

said plasticizing cylinder comprises a cylinder head and a cylinder shank, which are detachably interconnected;

said cylinder head encloses said high-pressure space throughout its axial length and also encloses said back-flow-preventing valve in all said initial rear positions of said feed screw;

said cylinder shank encloses said low-pressure space throughout its axial extent and also encloses said feed screw;

said cylinder head and said cylinder shank have confronting end faces, which define a joint, which along a circular line adjoins said inside peripheral surface at said low-pressure space;

both said confronting end faces have axially confronting finish-machined sealing surfaces; and

clamping means are provided for axially forcing said sealing surfaces of said confronting end faces against each other; said clamping means comprises a sleeve overlapping said cylinder head and said cylinder shank and is secured to said cylinder shank and is formed with an annular series of tapped through bores, and

clamp screws screwed through said tapped through bores and axially bearing on said sleeve and engaging said cylinder head at abutment surfaces formed on said cylinder head.

5,182,119

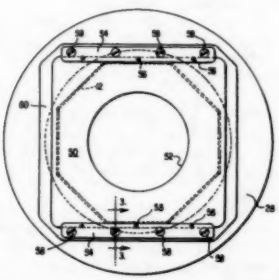
APPARATUS FOR PRODUCTION OF FREE FLOWING POLYTETRAFLUOROETHYLENE (PTFE) MOLDING PELLETS

William L. Edens, Bala Cynwyd, Pa., assignor to ICI Americas, Inc., Wilmington, Del.

Continuation of Ser. No. 687,135, Apr. 18, 1991, abandoned. This application Jun. 25, 1992, Ser. No. 904,907

Int. Cl.[5] B29C *67/00*

U.S. Cl. 425—222 **7 Claims**



1. An apparatus for the production of agglomerated PTFE molding pellets made from a powder PTFE resin, the apparatus including a rotary tube of predetermined length having a longitudinal axis and having an interior between an inlet end and an outlet end, the endmost region of the outlet end of said rotary tube provided with an apertured plate, said plane being mounted in a plane lying outside of the interior of said rotary tube the aperture of said plate and said outlet end of the rotary tube both being unobstructed, said outlet end provided with means to releasably affix said apertured plate to said outlet end, whereby plates having various aperture sizes may employ in the apparatus and wherein the apertured plate may be changed without entering the interior of the rotary tube.

5,182,120

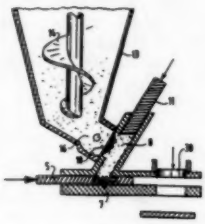
DEVICE FOR DOSING INTO MOULDS

Johannes K. O. Kusters, St. Oedenrode, and Joost A. W. H. Van Der Putten, Aarle Rixtel, both of Netherlands, assignors to Stork Titan B.V., Boxmeer, Netherlands

Filed Sep. 11, 1991, Ser. No. 757,579

Int. Cl.[5] A22C *7/00*

U.S. Cl. 425—238 **17 Claims**



1. A device for dosing into moulds a plastic, perishable mass, comprising:

a feed vessel;

a feed channel having an infeed and an outfeed, said infeed being connected to said feed vessel;

chamber means, connected to said outfeed of said feed channel and having an inlet and an outlet, for receiving a dose of said mass at said inlet via said outfeed of said feed channel;

mould means, situated at said outlet of said chamber means, for receiving said dose from said chamber means, said mould means comprising at least one hole in a top surface thereof, said hole being alignable with said outlet of said chamber means so as to receive said dose therefrom;

piston means, reciprocable within said chamber means, for pushing said dose out of said outlet of said chamber means and into said hole of said mould means on a forward stroke of said piston means, with a face of said piston means being generally coplanar with said top surface of said mould means at an end of said forward stroke; and

a valve situated within said feed channel and by which said outfeed is closeable.

5,182,121

HOT PRESS

Akimi Miyashita, Toride; Mutsumasa Fujii, Tsuchiura; Minoru Kubosawa, Kashiwa; Keiichiro Torii, Nagareyama; Nobuaki Ooki, Hadano; Kiyonori Kogawa, Hiratsuka; Masami Kawaguchi, Hadano; Hideyasu Murooka, and Masayuki Kyooi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Techno Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 9, 1990, Ser. No. 594,711

Claims priority, application Japan, Oct. 11, 1989, 1-263017

Int. Cl.[5] B29C *43/00*

U.S. Cl. 425—338 **2 Claims**

1. A hot press for mutually aligning materials of a multi-layer substrate of printed circuit boards and adhesive resin and interposing the materials into the heating plates and effecting heating and pressurization to form the multi-layer substrate, the hot press comprising:

a base frame;

a lower bolster movable up and down by a ram of a hydraulic cylinder supported by said base frame;

a column fixed to said base frame for guiding the up and down movement of the lower bolster;

an upper bolster fixed to an upper end portion of said column and confronting said lower bolster;

upper and lower heating plates respectively fixed through insulative plates to said upper and lower bolsters;

an intermediate heating plate located between said upper

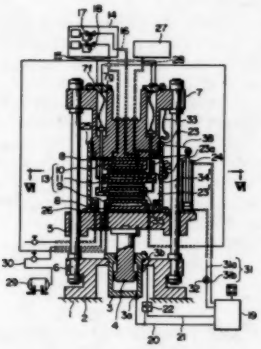
and lower heating plates and supported by said upper bolster;

heating means for supplying a thermal medium to said intermediate heating plate, said upper heating plate and said lower heating plate and collecting the thermal medium from the heating plate;

hydraulic pressure means for supplying pressurized oil to said hydraulic cylinder;

a sleeve movable up and down along a side surface of said upper bolster by moving means, said sleeve being adapted to surround said materials for the multi-layer substrate with a lower end portion of said sleeve being in contact with an upper surface of said lower bolster;

first sealing means for sealing an interior of said sleeve when



said sleeve is in contact with the upper surface of said lower bolster;

second sealing means for sealing an interior of said sleeve;

discharging means for discharging atmosphere contained in said sleeve maintained under a sealed condition by said first and second sealing means;

means for supplying a gas maintained at a predetermined pressure into said sleeve; and

a hydraulic means including a pilot check mechanism for preventing said lower bolster from being raised due to a differential pressure between the upper surface and lower surface of said lower bolster when the interior of said sleeve is maintained at one of a vacuum pressure condition and a high pressure condition due to the predetermined gas pressure.

5,182,122

APPARATUS FOR STRETCH BLOW MOLDING HOLLOW HEAT-RESISTANT CONTAINER

Shinichi Uehara; Kouichi Satou, and Seigo Baba, all of Ueda, Japan, assignors to Nissei Asb Machine Co., Ltd., Nagano, Japan

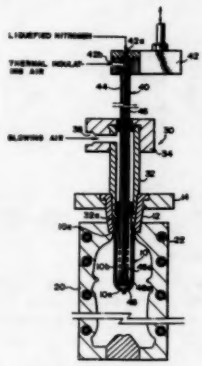
Division of Ser. No. 572,407, Aug. 27, 1990, Pat. No. 5,085,922. This application Sep. 25, 1991, Ser. No. 757,306

Claims priority, application Japan, Aug. 31, 1989, 1-224853

Int. Cl.[5] B29C *49/12, 49/58, 49/66*

U.S. Cl. 425—526 **8 Claims**

5. An apparatus for stretch blow molding a preform into a hollow container having a heat-resistant property, comprising a blow mold for forming the preform located therein by a biaxially stretching and blow molding process and a heat setting mold for holding the hollow container transferred from said blow mold at a temperature of heat setting for a predetermined period of time, wherein said apparatus further comprises a cooling medium introducing rod movable axially in the interior of said hollow container placed in said heat setting mold, said rod including a centrally located tube for introducing a cooling medium into the interior of the hollow container, said



cooling medium introducing tube being surrounded by thermally insulating means.

5,182,123

COMPOSITE LAMINATED DOUGH

Hiroshi Edo; Takashige Bannai; Toshihiro Hayashi, and Masayuki Sugie, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1991, Ser. No. 664,840

Claims priority, application Japan, Mar. 15, 1990, 2-65239; Mar. 15, 1990, 2-65240; Mar. 15, 1990, 2-65241

Int. Cl.[5] A21D *10/00*

U.S. Cl. 426—19 **3 Claims**

1. A composite laminated dough comprising at least two types of laminated doughs that differ substantially from each other by the presence and absence of baker's yeast, said two types of laminated doughs being superposed on each other, each of said laminated doughs being obtained by wrapping a fat in a dough mainly comprising wheat flour and by performing rolling and folding procedures.

5,182,124

METHOD AND APPARATUS FOR PRODUCING A SHEET OF DOUGH

Minoru Kageyama, and Yasuo Torikata, both of Utsunomiya, Japan, assignors to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Filed Apr. 22, 1991, Ser. No. 689,217

Claims priority, application Japan, Apr. 23, 1990, 2-107061

Int. Cl.[5] A21D *8/02*

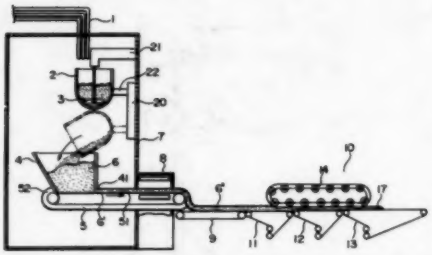
U.S. Cl. 426—19 **4 Claims**

1. A method of producing a sheet of dough comprising the steps of

mixing powdered materials, including flour, yeast, sugar, and fats and oils, for making bread, with particles of ice, such that the particles of ice do not melt, to make them into a powdered dough mixture,

forming the powdered dough mixture into a continuous powdered belt-like dough mixture having a uniform width and thickness such that the particles of ice do not melt,

melting said particles of ice to make a continuous hydrated belt-like dough mixture, and



stretching the continuous hydrated belt-like dough mixture thereby making a continuous sheet of dough and thereby generating a gluten network in the dough sheet.

5,182,125

PRODUCT PRODUCED BY PROCESS OF FREEZING AND ICE GLAZING BROCCOLI

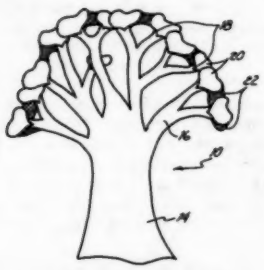
Dean H. Lockwood, Burnsville, William G. Schmidt, Maple Grove; and Jeffrey D. Carter, Circle Pines, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Continuation of Ser. No. 504,338, Apr. 4, 1990, Pat. No. 5,026,562. This application Apr. 25, 1991, Ser. No. 691,381

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[5] A23B *7/04*

U.S. Cl. 426—68 **2 Claims**



1. An ice glazed frozen broccoli floret product having a stalk, a plurality of stems extending from the stalk, a plurality of pedicels proximate an end of each stem, and a plurality of buds attached to the pedicels, and having a plurality of areas surrounding the adjacent buds, pedicels and a portion of the stems defining a plurality of crevices, the floret having an irregularly shaped outer surface, and having an ice glazing substantially filling the crevices, with an insignificant amount of ice glazing being present on the irregularly shaped outer surface of the floret, the glazing being at least about 8 percent by weight of the frozen floret.

2. A product produced by a process of forming a frozen broccoli product comprising individual broccoli florets having a floret structure including an irregularly shaped exterior surface, a plurality of stems, each stem having at least one pedicel, and a plurality of buds attached to the stem pedicels, and an area between the uppermost portions of the adjacent stems, pedicels, and between attached buds defining a plurality of crevices, the process comprises:

individually quick freezing each of said broccoli florets such that each floret is completely frozen throughout;

immersing each frozen broccoli floret in water for a length of time and at a water temperature sufficient to form an ice glaze within said crevices of the floret comprising at least about 8% by weight of the glazed frozen floret and such that the ice glaze substantially fills the crevices, and such that an insignificant amount of ice glaze is present on the exterior surface of the floret after the floret is removed from the water; and

then refreezing said ice glazed florets.

5,182,126

RUMINANT FEED SUPPLEMENT

Alfredo Vinci, Dayton, and Kenneth R. Cummings, Skillman, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Mar. 20, 1992, Ser. No. 853,967

Int. Cl.[5] A23K *1/00*

U.S. Cl. 426—74 **17 Claims**

1. A process for the preparation of a fatty acid salt feed supplement product which comprises (1) forming an admixture of reactive ingredients consisting essentially of (a) at least one C_{14}–C_{22} fatty acid, (b) between about 0.8–1.5 equivalents of basic alkaline earth metal compound per equivalent of C_{14}–C_{22} fatty acid, (c) between about 10–80 weight percent of an aqueous medium, based on the weight of fatty acid, and (d) between about 0.5–20 weight percent of a propionate glucogenous ingredient in an amount effective to increase the metabolic glucose content of the feed supplement, based on the weight of C_{14}–C_{22} fatty acid ingredient; and (2) recovering the salt product after completion of the exothermic salt-forming reaction.

5,182,127

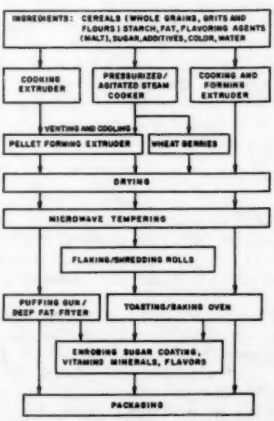
MICROWAVE TEMPERING OF COOKED CEREAL PELLETS OR PIECES

Edward C. Schwab, New Brighton, and George E. Brown, Edina, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Sep. 23, 1991, Ser. No. 764,288

Int. Cl.[5] A23L *1/00*; A21D *15/00*

U.S. Cl. 426—241 **35 Claims**



1. A method for tempering a cooked cereal piece comprising the step of:

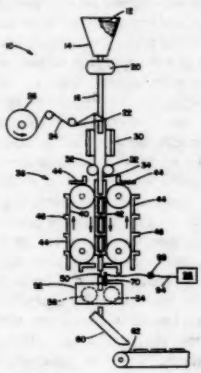
exposing a quantity of fresh cooked cereal pieces having a moisture content to a high intensity microwave field for a time duration sufficient to evenly distribute the moisture content without steam pressure generation within the piece and wherein the microwave field is greater than 90 V/cm.

5,182,128

METHOD AND APPARATUS FOR PRODUCING A WRAPPED FOOD MATERIAL IN SINGLE SLICE FORM

Christian Laplace, Quebec, Canada, assignor to Kraft General Foods Canada Inc., Don Mills, Canada

Filed Mar. 12, 1991, Ser. No. 667,838
Int. Cl.[5] B65B *3/00, 11/00*
U.S. Cl. 426—410 **9 Claims**



1. Apparatus for producing a wrapped food material in single slice form, comprising:

means to conduct the food material into a wrapping film to form a wrapped food material;

slice forming means to press the wrapped food material at spaced intervals to form a continuous strip of connected, wrapped food material slices

cutting means to cut said continuous strip at said spaced intervals to produce individually wrapped and sealed food material slices; and

means to guide said continuous strip from the slice forming means to the cutting means along a predetermined path of travel, and including

i) a guide plate located between the slice forming means and the cutting means, and extending along said path of travel, and

ii) means connected to the plate to develop a partial vacuum between said continuous strip and at least a portion of the guide plate to draw said strip thereagainst as the strip of connected slices passes to the cutting means, said guide plate having first and second opposite transverse sides, a guide surface for said strip and including a base member forming a groove extending inward from the guide surface, means located in the groove to conduct a first stream of air laterally outward from said groove and towards the first transverse side of the guide plate, and to conduct a second stream of air laterally outward from the groove and towards the second transverse side of the guide plate, said first and second streams of air producing a partial vacuum between a portion of the guide surface and the continuous strip of wrapped food material slices, said means to develop a partial vacuum including means to conduct pressurized air to said groove from a source of pressurized air.

7. A method for producing a wrapped food material in single slice form, comprising:

conducting the food material into a wrapping film to form a wrapped food material;

pressing the wrapped food material at spaced intervals to form a continuous strip of connected, wrapped food material slices;

conducting said continuous strip along a predetermined path of travel to a cutting apparatus, including

i) conducting the continuous strip past a guide plate extending along said path of travel, and

ii) developing a partial vacuum between the continuous strip and the guide plate to draw the continuous strip thereagainst; said developing step including:

conducting a first steam of air laterally outward in a first direction from a given area of the guide plate; and conducting a second stream of air laterally outward in a second direction from said given area of the guide plate; wherein said first and second streams of air produce a partial vacuum between the continuous strip of food material slices and said given area of the guide plate; and

using the cutting apparatus to cut the continuous strip at said spaced intervals to produce individually wrapped food material slices.

5,182,129

METHOD OF PREPARING A GLUTAMATE-FREE, SPREADABLE MEAT-CONTAINING CONDIMENT

Giuseppe Bastetti, and Sergio Veronesi, both of Milan, Italy, assignors to Barilla G.E.R. F.LLI - Societa Per Azioni, Parma, Italy

Filed Jun. 10, 1992, Ser. No. 896,892
Int. Cl.[5] A23L *1/313, 1/317*
U.S. Cl. 426—589 **13 Claims**

1. A method of preparing a meat-containing condiment on a commercial scale, which condiment is spreadable and glutamate-free, comprising the steps of:

heating fresh meat to extract a meat juice, free of heating water, from the fresh meat, removing substantially all fats of animal origin and cooking residue from the meat juice and then concentrating the meat juice to provide a concentrated meat juice which has a content of water-soluble proteins in the 25 to 65% range by weight of the overall weight of the juice and a concentration in the 15° to 90° Brix range;

mixing said concentrated meat juice with fresh minced meat to provide a mixture having a protein content in the 15 to 35% range by weight of the overall weight of said mixture;

dispersing at least one vegetable oil through said mixture; and then

cooking the vegetable oil containing mixture to a temperature in the 80° to 95° C. range to yield a spreadable meat product having a moisture content in the 10 to 20% range by weight and a protein content in the 25 to 40% range by weight of the overall weight of the product.

5,182,130

METHOD FOR PRODUCING AN EDIBLE PROLAMINE COATING FROM AN AQUEOUS LATEX

Stephen G. Haralampu, Plymouth; Stephen Sands, Wellesley, and Akiva Gross, Newton, all of Mass., assignors to Opta Food Ingredients, Inc., Cambridge, Mass.

Continuation of Ser. No. 432,988, Nov. 6, 1989, abandoned. This application Jun. 17, 1991, Ser. No. 717,174
Int. Cl.[5] A61K *9/38*
U.S. Cl. 427—3 **12 Claims**

9. A method of providing a barrier to gases, water, water vapor or oil on a substrate by coating the surface of the substrate with an edible prolamine comprising:

a) applying to the substrate an aqueous prolamine latex consisting essentially of an additive and prolamine microparticles that have a median volume diameter of from about 0.10 microns to about 150 microns that are suspended in an aqueous medium to form an aqueous suspension which is substantially free of organic solvent, devoid of a dispersing agent and which has from about 5% by weight to about 40% by weight of prolamine microparticles that are insoluble in the aqueous medium; wherein the additive is selected from the group consisting of waxes, oils, glycerides, proteins, flavors, colors, preservatives,

anti-oxidants, hydrocolloids, glycerol and synthetic polymers; and

b) drying the latex under conditions sufficient for the prolamine microparticles to fuse and form an edible continuous prolamine film on the surface of said substrate.

5,182,131

PLATING SOLUTION AUTOMATIC CONTROL

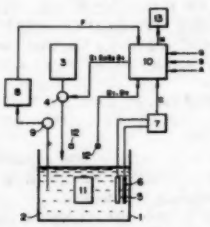
Shigeo Hashimoto, Ikoma, and Yutaka Sugiura, Kobe, both of Japan, assignors to C. Uyemura & Co., Ltd., Osaka, Japan

Continuation of Ser. No. 213,488, Jun. 30, 1988, abandoned, which is a continuation of Ser. No. 895,912, Aug. 13, 1986, abandoned. This application Sep. 13, 1989, Ser. No. 406,863

Claims priority, application Japan, Feb. 28, 1985, 60-39951

Int. Cl.[5] C23C *18/10*

U.S. Cl. 427—8 **1 Claim**



1. An apparatus for automatically and continuously controlling a concentration of an electroless plating solution comprising:

a plating tank containing an electroless plating solution therein,

a make-up tank containing a replenisher therein,

a supply means for supplying the replenisher in the make-up tank into the plating solution in the plating tank,

a heater,

a thermometer,

a thermoregulator for controllably maintaining the plating solution at a predetermined temperature, said thermoregulator operatively connecting said heater and thermometer,

an analyzer for measuring a concentration of a consumable ingredient in the plating solution,

a detector for detecting whether or not a workpiece to be plated is introduced in the plating solution, and

a control unit having a computer incorporated therein and operatively interconnected to a pump, thermoregulator, and analyzer,

said control unit having stored therein a set of information bits A relating to a plating solution composition and the deposition amounts per unit time from the plating solution at varying temperatures and surface areas of a workpiece to be plated, or the amount of a consumable ingredient to be consumed, or the amount of a replenisher to be supplied, and receiving a set of information bits B relating to the surface area of a workpiece to be plated and a set of information bits C relating to the temperature of the plating solution from the thermoregulator in order that upon receipt of surface area information B and temperature information C, the control unit computes the amount of plating film to be deposited on the workpiece per unit time, or the amount of a consumable ingredient to be consumed, or the amount of replenisher to be supplied,

wherein when the workpiece is dipped in the plating tank, the detector delivers a signal D1 indicative of the presence of the workpiece in the tank to the control unit and the control unit then supplies a signal E1 based on the result of the preceding computation to the supply means to actuate the supply means so as to provide a predetermined flow rate for a predetermined time, thereby making up the plating solution with a predetermined amount of the replenishment over a predetermined time, and when the workpiece is thereafter taken out of the plating tank, the detector gives another signal D2 indicative of the absence of the workpiece in the tank to the control unit and the control unit then supplies another signal E2 to the supplying means to interrupt the operation thereof,

said control unit being connected to the analyzer whereby a set of information bits F relating to the concentration of consumable ingredient is delivered from the analyzer to the control unit in order that comparing information F with a previously stored set of information bits G relating to the permissible concentration range of the consumable ingredient in the plating solution, the control unit delivers a signal E3 to the supplying means to interrupt its operation for a predetermined time to thereby interrupt the supply of the replenisher for the predetermined time when the concentration of consumable ingredient in the plating solution exceeds the permissible concentration range, or the control unit delivers another signal E4 to the supplying means when the concentration of consumable ingredient in the plating solution is below the permissible concentration range so that signal E4 commands the supplying means to increase the flow rate therethrough by a predetermined quantity and/or extend the operating duration thereof by a predetermined time to thereby increase the supply of the replenisher by a predetermined amount,

whereby a workpiece is electroless plated at a permissible concentration range of a consumable ingredient in the plating solution which is maintained by supplying the replenisher in an amount corresponding to the amount of the consumable ingredient determined from the surface area of the workpiece and by insuring whether or not the concentration is maintained within the permissible range by analyzing the consumable ingredient in the plating solution.

5,182,132

MAGNETIC RECORDING MEDIUM AND METHOD FOR MAKING IT

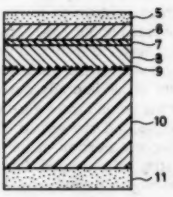
Mikio Murai, Hirakata; Kiyoshi Takahashi, Ibaraki; Masaru Odagiri, Kawanishi; Yoshiaki Kai, Neyagawa; Takashi Suzuki, Takatsuki, and Toshiaki Kunieda, Mino, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 3, 1990, Ser. No. 621,464

Claims priority, application Japan, Dec. 11, 1989, 1-321698

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—577 **4 Claims**



1. A method for making a magnetic recording medium comprising the steps of:

forming a ferromagnetic metal thin film on a substrate,

forming a polymer film on said ferromagnetic metal thin film

forming a diamond-like carbon film on said polymer film by plasma CVD method utilizing a.c. power (voltage Vac) in the frequency range of 80 Hz to 200 kHz which has peak voltage more than +500 V and hydrocarbon having a least 3 carbon atoms as material gas, and

forming a lubricant film on said diamond-like carbon film.

5,182,133
SEALER MATERIAL AND METHOD FOR APPLYING THE SAME

Kiyoshi Ono; Yoshio Kishimoto, and Tetsuhito Satou, all of Tokyo, Japan, assignors to Nichiban Company, Limited, Tokyo, Japan

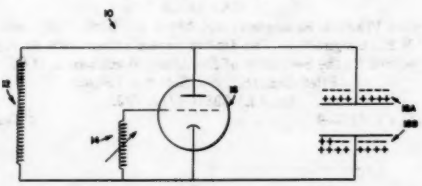
Division of Ser. No. 344,377, Apr. 28, 1989, Pat. No. 5,084,346. This application Oct. 17, 1991, Ser. No. 777,922
Claims priority, application Japan, Apr. 30, 1988, 63-108845
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—516 6 Claims

1. A method for applying a sealer material, which comprises:
pushing a sealer material comprising an ionizing radiation curable resin composition layer which is not flowable at a normal temperature and a sealer composition layer against a portion of a plate to be sealed to adhere and fix the sealer material thereon;
irradiating an ionizing radiation to fix the shape of the ionizing radiation curable resin composition layer; and
heating the sealer material to melt and cure the sealer composition layer.

5,182,134
RADIO FREQUENCY CURE OF THERMOSET-RECEPTOR COMPOSITIONS

Norman J. Sato, Maple Grove, Minn., assignor to H. B. Fuller Licensing & Financing Inc., Wilmington, Del.

Division of Ser. No. 619,248, Nov. 28, 1990, abandoned. This application Jan. 28, 1992, Ser. No. 826,620
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—543 21 Claims



1. A method of forming a cured thermoset composition by applying radio signals having a frequency of about 1 to 100 MHz to a composition comprising a major portion of thermoset and a receptor, said receptor having a dissipation factor of about 0.1 or greater and a dielectric constant of at least 0.1 or greater, said receptor selected from the group consisting of alkali or alkaline earth metal sulfate salts, aluminum trihydrate, quaternary ammonium salts, phosphonate compounds, phosphate compounds, polystyrene sulfonate sodium salts, or mixtures thereof, said method comprising the steps of:
(a) applying said composition to a substrate;
(b) applying radio signals to the composition deposited on the substrate; and
(c) dissipating the radio signals received by the receptor as thermal energy in an amount effective to cure the composition to a thermoset bond.

5,182,135
PROCESS FOR IMPROVING THE ADHERENCY OF METALLIC COATINGS DEPOSITED WITHOUT CURRENT ON PLASTIC SURFACES

Henning Giesecke, Leverkusen; Gerhard D. Wolf, Dormagen; Hanns P. Müller, Odenthal; Ulrich von Gizycki, and Martin Wienkenhöver, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

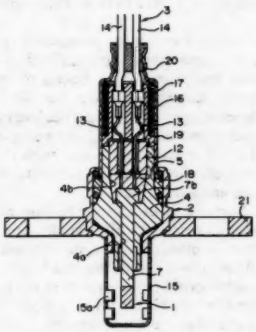
Continuation of Ser. No. 264,425, Oct. 31, 1988, abandoned, which is a continuation of Ser. No. 80,120, Jul. 31, 1987, abandoned. This application Mar. 18, 1991, Ser. No. 673,172
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1986, 3627256
The portion of the term of this patent subsequent to Mar. 20, 2007, has been disclaimed.
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—98 6 Claims

1. A process for improving the adherency of metal coatings deposited without current on plastic surfaces by treating the latter with printing paste formulations which contain, as essential components,
a) between about 0.03 to 4.00% by weight of an organometallic noble metal compound as activator,
b) between about 10 to 30% by weight of an unreactive polyurethane elastomer as binder,
c) between about 5 to 25% by weight of a filler, and
d) between about 40 to 90% by weight of a halogen-free solvent having a flashpoint >21° C. and a boiling point >100° C.,
the sum of the percents by weights of components a), b), c) and d) being less than or equal to 100% by weight.

5,182,136
GAS COMPONENT DETECTING ELEMENT AND DETECTOR

Toshiki Saburi, Ichinomiya; Masaya Fujimoto, Kariya; Tadashi Tsuruta, Nagoya, and Naochika Nunogaki, Yokkaichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 12, 1990, Ser. No. 580,970
Claims priority, application Japan, Sep. 12, 1989, 1-236328
Int. Cl.[5] B05D *5/12*
U.S. Cl. 427—126.3 9 Claims



9. A method for producing a gas component detecting element for detectors comprising an electrical insulating substrate and the gas component detecting element which comprises a sintered body of particles of titanium dioxide which changes in its electrical resistance depending on relative atmosphere of combustible components in an exhaust gas, catalyst particles being supported on the surface of the particles of titanium dioxide, the method comprising the following steps:
preparing the particles of titanium dioxide,
calcining the particles of titanium dioxide,

subjecting the calcined particles to a grinding treatment so that ratio of specific surface area A_1 of the calcined particles before subjected to grinding and specific surface area A_2 of the particles after subjected to grinding satisfies the relation $A_1/A_2 < 1.0$,

impregnating the particles of titanium dioxide subjected to the grinding treatment with a mixed solution of chloroplatinic acid and rhodium chloride,

adding an organic binder to the particles of titanium dioxide impregnated with the mixed solution to obtain a paste,

providing the pasty particles of titanium dioxide on a electrical insulating substrate in the form of a film at a given thickness, and

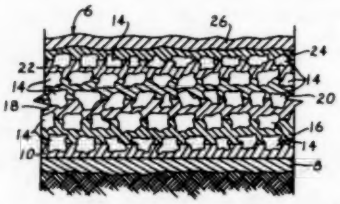
sintering the particles of titanium dioxide provided on the substrate at 800°-1300° C.

5,182,137

METHOD OF APPLYING A BOUND PARTICULATE RUBBER OUTDOOR SURFACE

Harold O. Allen, Fort Scott, Kans., assignor to 501 Amlite Corporation, Fort Scott, Kans.

Filed Feb. 8, 1991, Ser. No. 652,949
Int. Cl.[5] E01C 5/12
U.S. Cl. 427—138 **7 Claims**



1. A method of applying a latex-bound particulate rubber outdoor surface comprising the steps of:

providing a prepared base onto which the surface is to be applied;

applying a primer layer to the base, the primer layer being composed of a primer mixture including asphalt emulsion and water such that the layer is wet when applied and dries as the water separates from the mixture and evaporates;

directing a fluidized stream of particulate rubber onto the primer layer immediately after application of the primer layer before the primer layer begins to break so that a layer of particulate rubber settles into the primer layer;

applying a binder layer over the particulate rubber after the primer layer dries, the binder layer being composed of a mixture including latex and water such that the layer is wet when applied and dries as the water separates from the mixture and evaporates;

direction a fluidized stream of particulate rubber onto the binder layer immediately after application of the binder layer before the binder layer begins to break so that a layer of particulate rubber settles into the binder layer;

applying an additional binder layer over the layer of particulate rubber after the binder layer immediately beneath the layer of particulate rubber dries; and

repeating the steps of directing a fluidized stream of particulate rubber onto an underlying wet binder layer and of applying an additional binder layer over the particulate rubber upon drying of the binder layer immediately beneath the particulate rubber, until the surface is built-up to a desired thickness,

the steps of directing a fluidized stream of particulate rubber onto the primer and binder layers before the underlying exposed layer begins to break including mechanically pumping particulate rubber from a storage location and broadcasting the rubber onto the underlying exposed layer with the assistance of manual directing means for directing the flow of the particulate rubber.

5,182,138

LUMINESCENT SHEET FOR STAMP AND A METHOD FOR THE PRODUCTION THEREOF

Shigeji Matsuzawa, Itami; Eiji Yuasa, Takatsuki; Junichiro Tanaka, Nishinomiya, and Teruo Nakamura, Kobe, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1990, Ser. No. 618,944
Claims priority, application Japan, Nov. 27, 1989, 1-308706
Int. Cl.[5] B05D 1/12; B02C 23/02
U.S. Cl. 427—157 **10 Claims**

1. A method for the production of a luminescent sheet for stamps said sheet capable of being printed with a printing ink by gravure printing and to provide individual stamps which can be distinguished in a mail distinguishing system when said stamps are used on mail, said luminescent sheet comprising a substrate and a luminescent coating layer formed on the surface of said substrate, said method comprising

(i) subjecting an aqueous dispersion (A) containing particles (a) of an inorganic fluorescent pigment having a mean specific surface area of Sw_2 to wet-grinding using a wet-grinding machine, whereby said particles (a) of said aqueous dispersion (A) are finely ground to a mean specific surface area of Sw_1, thereby obtaining an aqueous dispersion (B) containing fine particles (b) of said inorganic fluorescent pigment having a mean specific surface area Sw_1, the said particles (b) satisfying the equation $2.0 \geqq Sw_1/Sw_2 \geqq 1.05$,

(ii) incorporating said aqueous dispersion (B) in an amount sufficient to provide an abrasion resistance of less than 1000 μg to the resulting luminescent coating layer into a coating composition (C) containing at least one pigment other than said fluorescent pigment to obtain a coating composition for the formation of said luminescent coating layer,

(iii) applying said coating composition obtained in step (ii) onto the surface of a substrate to form a liquid coating thereon, and

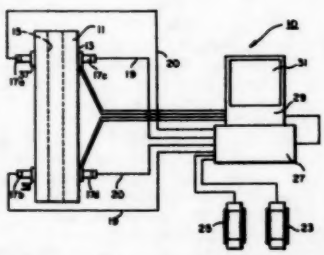
(iv) drying said liquid coating formed on said substrate.

5,182,139

ULTRASONIC REALTIME DETERMINATION AND DISPLAY OF THICKNESS OF CHROMIUM ON GUN BARRELS

Julius Frankel, Rensselaer, and Mark Doxbeck, Troy, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 16, 1991, Ser. No. 760,636
Int. Cl.[5] B05D 3/12, 7/22
U.S. Cl. 427—9 **2 Claims**



1. A method of plating an inner surface of a gun barrel, comprising the steps of:

providing ultrasonic pulse echo waves against said gun barrel to be plated; wherein at least three transducers are

aligned radially and equidistantly from one another around an outside surface of said barrel, and a second set of at least three transducers are similarly aligned at a second axial location on the outside of said barrel, to reflect said waves from both the outside and the inner surfaces of said gun barrel; plating said inner surface while monitoring echoes made by the reflected waves;

calculating change in thickness by measuring change in time for said echoes to return to their source, whereby the change in time for the inside surface indicates the change in thickness of plating thereon.

5,182,140

METHOD AND APPARATUS FOR LIQUID COATING FOR HONEYCOMB STRUCTURE

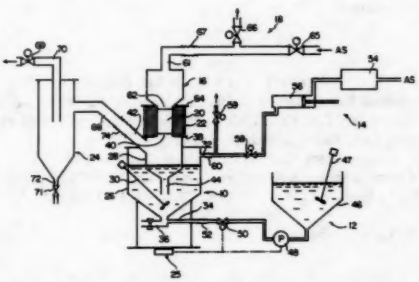
Tateshi Watanabe, Fuji; Tsunao Watanabe, Numazu; Tadashi Watanabe, Numazu; Hidetomo Matsugu, Numazu, and Yasuhiro Yamanouchi, Numazu, all of Japan, assignors to N.E. Chemcat Corporation, Tokyo, Japan

Filed Nov. 16, 1990, Ser. No. 614,629

Claims priority, application Japan, Nov. 16, 1989, 1-296127; Jun. 4, 1990, 2-144418

Int. Cl.[5] B05D *7/22, 5/00*

U.S. Cl. 427—230 **3 Claims**



1. A liquid coating method for coating a liquid onto inner cells of a honeycomb structure, comprising the steps of:

supplying a liquid to an inside of a honeycomb structure vertically arranged from its lower part until the liquid surface completely reaches a position higher than the upper end surface of the honeycomb structure to cause the liquid to adhere to the inner cells; and

supplying pressurized air onto an upper part of the honeycomb structure and letting the pressurized air out from an upper part of the honeycomb structure through its inner part to its lower part to discharge the liquid within the inner cells.

5,182,141

BILAMINATE POLYMER COATED METAL STRIP AND METHOD FOR MANUFACTURE THEREOF

Tadeusz Borys, Markham; Shueh-Mo Lee, Downsview, and Earlby E. J. Wakefield, Guelph, all of Canada, assignors to Co-Ex-Tec Industries, Concord, Canada

Filed Feb. 13, 1990, Ser. No. 479,469

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—379 **16 Claims**

1. A process for the manufacture of a bilaminate coated metal substrate comprising:

(a) preparing the metal substrate for application of adhesives thereto;

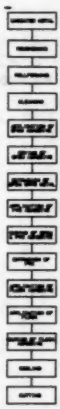
(b) applying a first activable adhesive to a first area of the substrate which is to be coated by a first layer of a thermosetting polymer;

(c) activating the adhesive to ready the substrate for application of the thermosetting polymer;

(d) applying the thermosetting polymer to the first area to form the first layer;

(e) heating the thermosetting polymer to cure it;

(f) applying a second activable adhesive to a second area of the substrate which is to be coated by a second layer of a thermoplastic polymer;



(g) activating the second adhesive; and

(h) applying the thermoplastic polymer to the second area to form the second layer whereby a bilaminate metal substrate having the first layer chemically bonded thereto and the second layer chemically bonded to the second area of the substrate is produced.

5,182,142

METHOD FOR FORMING A TRANSPARENT COATING ON RUBBER ARTICLES

George M. Hart, Adrian, and Mark E. Hayford, Blissfield, both of Mich., assignors to Wacker Silicones Corporation, Adrian, Mich.

Division of Ser. No. 515,534, Apr. 30, 1990, Pat. No. 5,066,703, which is a continuation of Ser. No. 285,174, Dec. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 245,486, Sep. 19, 1988, abandoned. This application Apr. 2, 1991, Ser. No. 679,402

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—393.5 **11 Claims**

1. A method for forming a transparent coating on rubber articles which when vulcanized are free of surface defects which comprises applying to a surface of an unvulcanized rubber article an aqueous composition containing (A) from 1 to 80 percent by weight based on the weight of the composition of preformed latex selected from the class consisting of natural rubber and synthetic polymers obtained from insitu polymerization of emulsified monomers, said synthetic polymers are selected from the class consisting of homopolymers of conjugated dienes and copolymers of the conjugated dienes and monomers having monethylenic unsaturation selected from the class consisting of styrene, substituted styrenes, and vinyl pyridine, (B) from 0.01 to 20 percent by weight based on the weight of the composition of an emulsifying agent selected from the group consisting of anionic and nonionic emulsifying agents, (C) from 2 to 80 percent by weight of the composition of a filler consisting of an inorganic fluoro-containing compound having a refractive index in the range of from 1.32 to 1.49, which is selected from the group consisting of an alkali metal fluoro compound, an alkaline earth metal fluoro compound, aluminum fluoride and sodium fluoaluminate, (D) from 0.1 to 10 percent by weight based on the weight of the composition of a thickening agent selected from the class consisting of

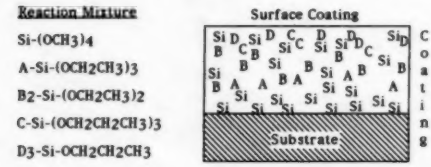
synthetic gums, water-soluble polysaccharides, polyacrylic acids and mixtures thereof, and (G) from 20 to 85 percent by weight of water based on the weight of the composition and thereafter vulcanizing the coated rubber article.

5,182,143

LAYERED SOL-GEL COATINGS

Stephen R. Holmes-Farley, Raleigh, and Lynn C. Yanyo, Cary, both of N.C., assignors to Lord Corporation, Erie, Pa.

Filed Feb. 28, 1990, Ser. No. 486,367
Int. Cl.[5] B05D *1/36, 7/00*
U.S. Cl. 427—409 **38 Claims**



1. A method of providing a substrate with a thin film coating of multiple layers by a single immersion of the substrate in a coating solution, said method comprising immersing a substrate having active hydrogens on its surface into a coating solution comprising two or more dissimilar hydrolyzable and condensable organometallic compounds of a polymeric network-forming cation, water, a solvent, and a base, said solution having undergone substantially no polymer growth prior to immersion of said substrate, allowing said substrate to remain in said coating solution for a time sufficient to form in situ said thin film coating of multiple layers on said substrate, and removing and drying said substrate having said thin film coating of multiple layers, said organometallic compounds having reactivities defined by the rates of hydrolysis and condensation of said organometallic compounds in said solution sufficiently different so that the most reactive of said organometallic compounds hydrolyzes and condenses to form a first thin coating layer on said substrate, followed by formation of subsequent thin coating layers by hydrolysis and condensation of the other organometallic compounds, said subsequent layers being formed substantially in decreasing order of the reactivities of the other organometallic compounds.

5,182,144

ORNAMENT ASSEMBLY

Jack Hou, Taipei, Taiwan, assignor to Giftec, Ltd., Taipei, Taiwan

Filed Jul. 29, 1991, Ser. No. 736,935
Int. Cl.[5] B44C *3/06*
U.S. Cl. 428—16 **7 Claims**

1. An ornament assembly comprising:

a) a base member for supporting the assembly on a horizontal surface, the base member including an upper surface having a base socket formed therein;

b) an elongate tappet rod having an upper end and a lower end, the lower end of the rod being secured within the base socket so that the rod extends vertically from the upper surface of the base member; and

c) a socket member including a downwardly extending socket, with the upper end of the tappet rod being engaged within the downwardly extending socket, and an

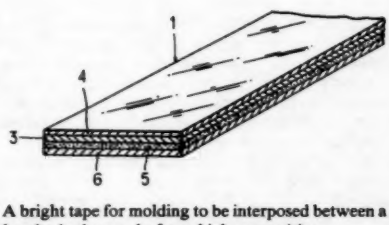
upwardly extending socket for receiving a decorative ornament.

5,182,145

BRIGHT TAPE FOR MOLDING

Katsuhisa Kato, Moriya, Japan, assignor to Tokiway Chemical Industries, Co., Ltd., Chiba and System Technical Industries Co., Ltd., Ibaragi, both of, Japan

Filed Mar. 28, 1990, Ser. No. 500,783
Claims priority, application Japan, Jun. 30, 1989, 1-77286[U]; Oct. 6, 1989, 1-117831[U]; Oct. 20, 1989, 1-122826[U]
Int. Cl.[5] B60R *13/00*
U.S. Cl. 428—31 **4 Claims**



1. A bright tape for molding to be interposed between a glass panel and a body panel of a vehicle comprising:

a metalized film,

an ethylene copolymer resin layer melt laminated on one surface of the metalized film,

an ionomer resin layer polymerized on the outer surface of said ethylene copolymer resin layer, and

a vinyl chloride sheet attached by an adhesive agent to the other surface of the metalized film.

5,182,146

DECORATIVE VEHICLE AIR SPEED INDICATOR

Robert S. O'Hara, 2117 Willow St., Port Townsend, Wash. 98368

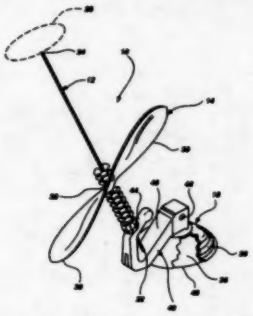
Filed Mar. 7, 1991, Ser. No. 665,689
Int. Cl.[5] B60R *13/00*
U.S. Cl. 428—31 **12 Claims**

1. An air speed indicator for use on a vehicle having an exterior surface, the indicator comprising:

a rotor having a hub with a tapered opening and blades;

a straight, elongate shaft slidably received through said

tapered opening in said rotor and having a smooth exterior surface to facilitate rotation of said rotor on said shaft; and means for mounting said shaft to an exterior surface of a



vehicle with the shaft positioned at a predetermined angle away from the relative airflow such that said rotor will rotate on said shaft and freely slide in both directions along said shaft in response to the relative airflow.

5,182,147

COMPOSITE HOSE

Eric J. Davis, Wirral, United Kingdom, assignor to Dantec Ltd., Moreton, England

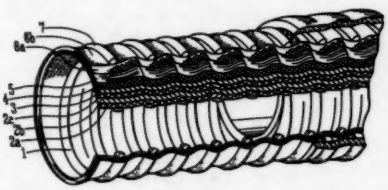
PCT No. PCT/GB89/01194, § 371 Date Apr. 12, 1991, § 102(e) Date Apr. 12, 1991, PCT Pub. No. WO90/04128, PCT Pub. Date Apr. 19, 1990

PCT Filed Oct. 9, 1988, Ser. No. 674,359

Claims priority, application United Kingdom, Oct. 14, 1988, 8824153

Int. Cl.[5] F16L *11/08;* B27N *9/00*

U.S. Cl. 428—34.4 **12 Claims**



1. A fire-resistant composite hose for transporting flammable liquids, comprising:

an inner helical core of a metallic material;

a first layer of plastics material fibers helically wound on said inner core to prevent the inner core from damaging the hose;

a plurality of layers of plastics material films helically wound around the first fibers layer to seal the hose and to prevent flammable liquid from permeating through the hose;

a second layer of plastics material fibers wrapped around the films layer for providing a working pressure to the hose;

at least one layer of glass cloth for thermal insulation and at least one layer of aluminum foil to reflect heat disposed adjacent one another and helically wound onto the second layer of plastics material fibers; and

an outer helical former made of metallic material wound around the layers of glass cloth and aluminum foil.

5,182,148

COATINGS AND METHOD FOR COLORING LIGHT-TRANSMITTING CONTAINERS

David C. Kapp; Russell E. Boston; Leland H. Carlblom, all of Richland Township, Allegheny County; Mildred L. McKinley, Shaler Township, Allegheny County, and Jess A. Kozma, Verona, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 557,448, Jun. 11, 1990, Pat. No. 5,085,903. This application Dec. 19, 1991, Ser. No. 810,061

The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.[5] B32B *27/06;* B05D *5/06*

U.S. Cl. 428—34.6 **11 Claims**

1. A water-based, thermosetting, transparent colorant coating composition comprising: (i) a film-former including a resin and an internal or external crosslinking agent; (ii) a metal-free polymeric dye which is reactive with the film-former; and (iii) an adhesion promoter in an effective combination to form a transparent thermoset coating for coloring containers.

6. A process for coloring a light-transmitting container comprising coating the container with a thermosetting, water-based coating composition comprising a film-former including a resin and an internal or external crosslinking agent, a metal-free polymeric dye which is reactive with the film-former, and an adhesion promoter in an effective combination to form a coating which partially absorbs transmission of visible light.

7. An article of matter comprising a substrate to which has been applied the water-based thermosetting coating composition of claim 1.

5,182,149

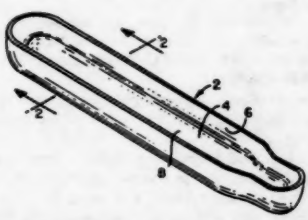
BORON NITRIDE BOAT AND PROCESS FOR PRODUCING IT

Robert L. Finicle, Bay Village, Ohio, assignor to Praxair S.T. Technology, Inc., Danbury, Conn.

Division of Ser. No. 516,910, Apr. 30, 1990, Pat. No. 5,032,366. This application Mar. 1, 1991, Ser. No. 662,954

Int. Cl.[5] B65D *1/00*

U.S. Cl. 428—34.6 **8 Claims**

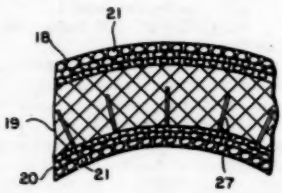


1. A pyrolytic boron nitride boat having a cavity and said pyrolytic boron nitride comprising a multi-laminated structure of boron nitride in which each lamina of the multi-laminated structure of the boron nitride defining said cavity has a nodular surface and wherein said nodular surface of the top lamina is composed of a substantially uniform distribution of projected nodules in which the average height of the projected nodules is at least two times greater than the thickness of the boron nitride top lamina.

5,182,150
COMPOSITE SPHERE FOR A MOTION BASE SIMULATOR

Joseph M. Carlos, Southbury; Thomas A. Carstensen, Shelton; William J. Hall, Cheshire, and Larry J. Osiecki, Oxford, all of Conn., assignors to United Technologies, Corp., Hartford, Conn.

Filed Jul. 16, 1990, Ser. No. 553,871
Int. Cl.[5] B65D *8/00*; G09B *9/08*
U.S. Cl. 428—35.7 **20 Claims**



1. A simulator dome for a motion based simulator comprising an outer fiber reinforced polymer impregnated layer, an inner fiber reinforced polymer impregnated layer, and an intermediate foam core of predetermined density disposed therebetween, the core having different densities in different portions of the dome to adjust the center of gravity thereof.

20. A crack resistant motion base simulator for simulating high G maneuvers comprising

a simulator dome having an outer fiber reinforced polymer impregnated layer, an inner fiber reinforced polymer impregnated layer and an intermediate foam core of predetermined density disposed therebetween, the core having different densities in different portions of the dome to adjust the center of gravity thereof.

a platform for supporting the dome;

actuator means for moving the platform and dome to simulate YAW, pitch and roll of an aircraft; and

control means, responsive to the motions of a pilot and a simulator program for directing the actuators to simulate flight.

5,182,151
THERMOPLASTIC RESIN COMPOSITION

Motonobu Furuta, Tsukuba, and Mitsuji Tsuji, Ichihara, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 29, 1990, Ser. No. 545,827
Claims priority, application Japan, Jul. 10, 1989, 1-177717
Int. Cl.[5] B29D *22/00*; C08F *283/08*; C08L *71/12*
U.S. Cl. 428—36.92 **13 Claims**

1. A thermoplastic resin composition comprising

(a) a modified polyphenylene ether or a composition containing it,

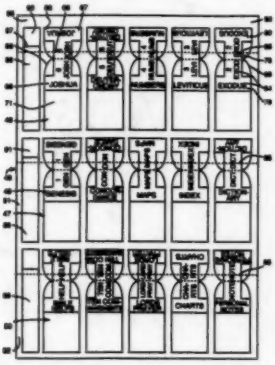
(b) (i) a modified propylene polymer comprising propylene polymer which is graft-copolymerized with a styrene based monomer or with a mixture of a styrene based monomer and a monmer copolymerizable therewith, or (ii) a composition containing the modified propylene polymer in (b)-(i) and propylene polymer, and

(c) a rubber-like substance containing at least one rubber-like substance having a polar group, wherein the proportion of the component (a) to the component (b) is 1 to 98% by weight of (a) : 99 to 2% by weight of (b), wherein the component (c) is present in an amount of 11 to 50 parts by weight per 100 parts by weight of the sum of the components (a) and (b).

5,182,152
LABEL DISPENSING SHEET

Thomas H. Ericson, 1733 S. 5th St., Milwaukee, Wis. 53204

Division of Ser. No. 397,772, Aug. 23, 1989, Pat. No. 4,978,143.
This application Dec. 17, 1990, Ser. No. 628,618
Int. Cl.[5] A61F *13/02*
U.S. Cl. 428—42 **13 Claims**



1. A label dispensing sheet, comprising:

a backing sheet having a layer of a pressure sensitive adhesive releasing material on a face thereof and having a weakened line across the width thereof;

a row of labels releasably disposed on said backing sheet overlying said weakened line, each of said labels comprising a base layer having a layer of pressure sensitive adhesive coated on a bottom face thereof and disposed in face-to-face contact with said release layer of said backing sheet, and having indicia disposed on a top face thereof; and

a release strip releasably disposed on said backing overlying said weakened line in said backing sheet, said strip having a layer of adhesive on a bottom face thereof in face-to-face contact with said release layer of said backing sheet, said release strip having a weakened line extending in the widthwise direction thereof at a position offset from said weakened line in said backing sheet.

5,182,153
FLEXIBLE MAGNETIC DISC

Akira Miyake, Mishima, and Yoshinori Yamamoto, Takatsuki, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jul. 7, 1989, Ser. No. 376,509
Claims priority, application Japan, Jul. 13, 1988, 63-174635
Int. Cl.[5] G11B *23/00*; B05D *5/12*; C23C *14/00*; B32B *3/02*
U.S. Cl. 428—64 **6 Claims**

1. A flexible magnetic disc comprising a non-magnetic substrate consisting of a polyethylene terephthalate film and at least one magnetic layer which comprises a magnetic powder and a binder comprising a polyurethane resin and a polyisocyanate on at least one surface of said film substrate, which flexible magnetic disc is shrunk after formation of said magnetic layer and before blanking, such that it has a dimensional shrinkage factor of not more than 0.04% in a radial direction measured after said magnetic disc has been first kept at 60° C., and 90% RH for 64 hours and then maintained at room temperature for 72 hours.

5,182,154

STAIN RESISTANT NYLON CARPETS

Randolph C. Blyth, Gulf Breeze, and Pompelio A. Ucci, Pensacola, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 370,099, Jun. 21, 1989, Pat. No. 4,892,558, which is a continuation of Ser. No. 296,301, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 84,777, Aug. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 59,714, Jun. 8, 1987, abandoned, which is a continuation of Ser. No. 914,507, Oct. 2, 1986, Pat. No. 4,680,212, which is a continuation of Ser. No. 834,804, Mar. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 643,606, Aug. 23, 1984, abandoned, which is a continuation of Ser. No. 562,370, Dec. 16, 1983, abandoned. This application Dec. 26, 1989, Ser. No. 457,201

The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.

Int. Cl.[5] B32B *27/34, 3/02;* D02G *3/00*

U.S. Cl. 428—96 8 Claims

1. A carpet having a pile composed of nylon fibers, said carpet being dyed to a single color and said fibers being coated with a sufficient amount of sulfonated condensation product containing —SO_3X radicals, where X is hydrogen or a cation, to provide a carpet which, when 64 ounces (1892.5 ml) of an aqueous solution of cherry flavored soft drink premix containing 0.054 grams per liter of Red Dye No. 40 is poured onto said pile from a height of one meter and left overnight followed by washing of said pile with water for removal of excess solution therefrom, no visual evidence of said Red Dye No. 40 remains on said pile.

5,182,155

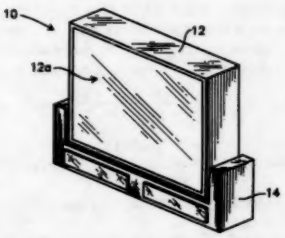
RADOME STRUCTURE PROVIDING HIGH BALLISTIC PROTECTION WITH LOW SIGNAL LOSS

Bob J. Roe, Santa Barbara, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Apr. 15, 1991, Ser. No. 687,038

Int. Cl.[5] B32B *3/12*

U.S. Cl. 428—116 10 Claims



1. A ballistic protection structure for a radar system including an electronic unit and an antenna element, comprising:

a radome including a composite wall structure having alternating layers of extended chain polyethylene fiber laminate material and honeycomb core material, the electronic unit and antenna element being disposed inside the radome such that the antenna element is spaced between the electronic unit and the wall structure; and

a backing plate disposed inside the radome between the electronic unit and the antenna element, the backing plate in combination with the wall structure providing a predetermined limit value of ballistic protection for the electronic unit.

5,182,156

COMPOSITE LAMINATE ADHESIVE TAPE COILED IN AN ENDLESS ROLL FORM AND PROCESS FOR FORMING THE LAMINATE ADHESIVE TAPE ROLL

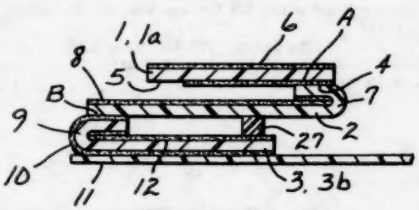
Peter H. K. Pape, Hilden, and Jorg O. P. Tuschy, Bedburg, both of Fed. Rep. of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 3, 1991, Ser. No. 770,578

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1990, 4033850

Int. Cl.[5] B32B *3/04*

U.S. Cl. 428—130 9 Claims



1. Composite laminated adhesive tape coiled endlessly in roll form, comprising a central tape and first and second fastening tapes each disposed at opposite ends of the central tape, with the surfaces of said fastening tapes being provided at least partly with pressure-sensitive adhesive,

the composite laminated adhesive tape coiled endlessly in roll form is folded in Z-form, with the top, slanted and bottom bars of the Z-shape being formed by separate first, second and third tape sections of first fastening tape, central tape or second fastening tape, respectively, the pressure-sensitive adhesive coatings are provided on the surface of the first fastening tape facing toward the central tape section and on the surface of second tape facing away from the central tape section,

one end of the central tape and the opposite end of the second fastening tape are turned over toward the first tape section or the second tape section, respectively, to provide bonding and adhesive surfaces on folds to affix the first fastening tape, to the central tape, and the central tape to the second fastening tape, respectively, and the adhesive coating on the first fastening tape contacts said bonding surface at the fold of the central tape and the adhesive coating on the second fastening provides said adhesive surface at the fold of the second fastening tape.

5,182,157

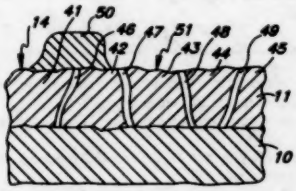
METHOD OF FORMING A COATED SHEET WHICH WICKS AWAY OIL AND PRODUCT THEREOF

John J. Fitch, Natick, Mass., assignor to Van Leer Metallized Products (U.S.A.) Limited, Mid-Glamorgan, Wales

Continuation-in-part of Ser. No. 608,049, Nov. 1, 1990. This application Oct. 15, 1991, Ser. No. 376,148

Int. Cl.[5] B32B *3/10, 3/26*

U.S. Cl. 428—137 6 Claims



1. A coated sheet for decorative or informational applications, comprised of:

A. a substrate

B. an oil absorbing layer associated with the substrate having an oilabsorbing surface,

C. a decorative layer having a first side and a second side, the second side being attached to the substrate, the decorative layer being formed of a porous membrane having pores which pass through the decorative layer from the first side to the second side, each pore having a surface adapted to attract oil from the first side of the decorative layer and convey the oil to the oilabsorbing layer.

5,182,158

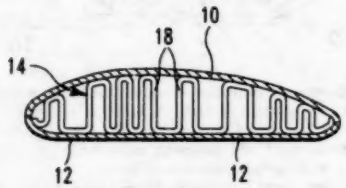
LIGHTWEIGHT SANDWICH PANEL

Bernarr C. Schaeffer, 129 Lawrenceville Rd., Rosendale, N.Y. 12472

Filed Feb. 2, 1990, Ser. No. 478,281

Int. Cl.[5] B32B *3/12*; E04C *2/54*

U.S. Cl. 428—178 **1 Claim**



1. A sandwich panel comprising outer layers, and a core layer comprising elements bonded to one of the outer layers and having projections bonded to the other outer layer, the projections having relatively flat areas at their free ends to provide broad bonding areas, the flat areas being chemically bonded to the other outer layer, the core layer being a plastic sheet and the projections being formed from the sheet, and the projections per area being varied in density to provide different deflection resistances in various parts of the panel, wherein one of the outer layers is transparent, and the core layer is dark to absorb the sun's ray and open to the passage of air through it.

5,182,159

ELECTROSTATIC RECORDING MATERIAL

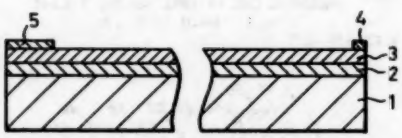
Hiroshige Yamauchi; Takashi Ogasawara, and Tomotsugu Takahashi, all of Tokyo, Japan, assignors to Oji Paper Co., Ltd., Shinjuku, Japan

Filed Jan. 24, 1991, Ser. No. 645,440

Claims priority, application Japan, Jan. 25, 1990, 2-13707

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—192 **9 Claims**



1. An electrostatic recording material comprising:

an electrical insulating support;

an electroconductive intermediate layer formed on a surface of the support;

a dielectric layer formed on the electroconductive intermediate layer; and

a pair of electroconductive side edge layers formed on a record-starting side edge portion of the dielectric layer, in which record-starting side a recording operation in a transversal direction of the recording material is started, and on a record-ending side edge portion of the dielectric layer, in which record-ending side the recording operation is ended, extending along the longitudinal axis of the recording material, spaced from each other, and each having a surface resistivity of from 1×10^4 to 5×10^5 Ω, and each electroconductive side edge layer comprising carbon black and a resinous binder, having a weight of 0.5 to 10 g/m^2, and having a width of 0.5 to 10 mm, and

said electroconductive record-starting side edge layer having a surface resistivity ratio of 2:1 to 10:1 to said electroconductive record-ending side edge layer.

5,182,160

THERMAL-TRANSFER RECORDING MEDIUM

Shigehiro Kitamura; Hiroshi Watanabe, and Takao Abe, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 16, 1991, Ser. No. 777,062

Claims priority, application Japan, Oct. 19, 1990, 2-282300

Int. Cl.[5] B32B *3/00*

U.S. Cl. 428—195 **11 Claims**

1. A thermal-transfer recording medium comprises a support having thereon a peeling layer comprising principally a microcrystaline wax whose penetration number at 25° C. is not more than 20, and a heat-meltable ink layer.

5,182,161

SUPPORT FOR PHOTOSENSITIVE MATERIALS

Touru Noda, Matsudo; Masayuki Tsubaki; Yasunosuke Sakai, both of Tokyo, all of; Tetsuya Ashida, Seattle, Wash., and Hiroshi Matsuda, Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Jul. 9, 1991, Ser. No. 727,820

Claims priority, application Japan, Jul. 10, 1990, 2-182096; Jul. 23, 1990, 2-194169

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—195 **14 Claims**

1. A support for photosensitive materials which comprises base paper comprising natural kraft pulp, and a resin layer formed on the base paper, said natural kraft pulp being produced by digesting wood chips by a kraft process, and washing the digested product in the presence of an anti-foaming agent or a foam-inhibitor, followed by bleaching by the use of chlorine or an oxidizing agent containing at least one chlorine atom, and said natural kraft pulp having a number of tarnished or stained areas by silver tarnishing reaction of 20 or less.

5,182,162

SELF-BONDED NONWOVEN WEB AND NET-LIKE WEB COMPOSITES

Frank G. Andrusko, Alpharetta, Ga., assignor to Amoco Corporation, Chicago, Ill.

Filed Oct. 24, 1990, Ser. No. 602,519

Int. Cl.[5] B32B *5/06*

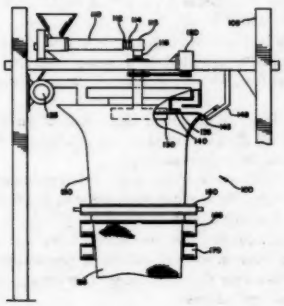
U.S. Cl. 428—219 **20 Claims**

1. A self-bonded nonwoven web and thermoplastic net-like web composite comprising,

at least one layer of a uniform basis weight self-bonded, fibrous nonwoven web comprising a plurality of substantially randomly disposed, substantially continuous thermoplastic filaments wherein said web has a Basis Weight Uniformity Index of 1.0±0.05 determined from average basis weights having standard deviations of less than 10%, adhered to

at least one layer of a thermoplastic net-like web comprising a net-like structure of a multiplicity of aligned thermoplas-

tic elements wherein a first segment of elements is aligned at about a 45° to about 90° angle to a second segment of



elements thereby defining a border for multiple void areas of the net-like structure.

5,182,163

FLAME RETARDANT FOAM MATERIAL

James A. Wheat, Ottawa; Rolland P. Fuoco, Hull, and J. Kimberley Dix, Ottawa, all of Canada, assignors to Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Nov. 5, 1991, Ser. No. 787,876

Claims priority, application Canada, Dec. 24, 1990, 2033114

Int. Cl.[5] B32B *7/00*

U.S. Cl. 428—224 **19 Claims**

2. A fire-retardant air and water permeable foam material resistant to passage therethrough of noxious chemicals in liquid or vapor form consisting of:

a flexible open-cell foam and, impregnated in said foam, an aqueous dispersion of:

finely divided activated carbon	100
decabromodiphenyl oxide as a solid fire-retardant	10 to 45
an after-glow suppressant	5 to 20
a water-insoluble organic binder for bonding said particles in said foam	15 to 30

wherein the proportions of ingredients are expressed in parts per 100 parts of activated carbon.

14. A fire-retardant material according to claim 2, bonded to an air and water vapour permeable fabric.

5,182,164

WET PRESS FELT TO BE USED IN PAPERMAKING MACHINE

Nils O. Eklund, East Greenwich, R.I.; Johan L. Olsson, and Lars-Magnus Ström, both of Halmstad, Sweden, assignors to Nordiskafilt AB, Halmstad, Sweden

Filed May 25, 1989, Ser. No. 357,430

Claims priority, application Sweden, Jun. 9, 1988, 8802153; Jun. 9, 1988, 8802154

Int. Cl.[5] B32B *5/02*

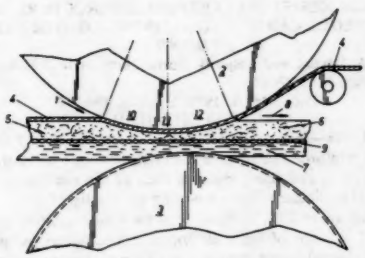
U.S. Cl. 428—234 **12 Claims**

1. A dewatering felt to be used as a press felt in the press section of a papermaking machine, to dewater fibrous material, which comprises a plurality of layers including:

a base fabric of interwoven lengthwise and crosswise yarns, said lengthwise yarns being in the direction of travel of said felt on said papermaking machine, said base fabric having a first surface and a second surface;

a first layer on said first surface of said base fabric, said first layer being a non-woven batt of staple fibers needled to said base fabric, said first layer further being a surface layer facing and abutting said material to be dewatered; and

a second layer, said second layer being a barrier layer beneath said surface layer and having a higher flow resistance in the thickness direction than said first layer, said



second layer being a non-woven batt of staple fibers, needled to said base fabric, wherein said staple fibers of said second layer are predominantly oriented in said direction of travel of said felt, and wherein said second layer is needled to said second surface of said base fabric.

5,182,165

COATING COMPOSITIONS

Thomas J. Clough, Santa Monica; Victor L. Grosvenor, Topanga, and Naum Pinsky, Thousand Oaks, all of Calif., assignors to Ensci, Inc., Santa Monica, Calif.

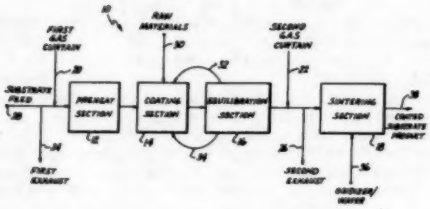
Continuation-in-part of Ser. No. 272,517, Nov. 17, 1988, abandoned, and a continuation-in-part of Ser. No. 272,539, Nov. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 82,277, Aug. 6, 1987, Pat. No. 4,787,125, which is a division of Ser. No. 843,047, Mar. 24, 1986, Pat. No. 4,713,306. This application May 8, 1989, Ser. No. 348,786

Int. Cl.[5] B32B *7/00*

U.S. Cl. 428—263 **37 Claims**

1. A structural element comprising a three dimensional substantially inorganic element wherein said inorganic element

is selected from the group consisting of a substantially carbon composite and a ceramic and a tin oxide-containing coating



thereon, said structural element being adapted for use at a temperature greater than about 400° F.

5,182,166

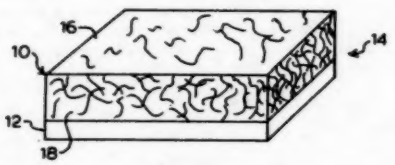
WEAR-RESISTANT COMPOSITE STRUCTURE OF VITREOUS CARBON CONTAINING CONVOLUTED FIBERS

Ralph A. Burton, and Ralph G. Burton, both of 1825 Ridge Rd., Raleigh, N.C. 27607

Filed May 1, 1991, Ser. No. 694,112
Int. Cl.[5] C01B *31/02*
U.S. Cl. 428—368 **17 Claims**

1. A reinforced composite material, having a three-dimensional (x,y,z) character, wherein each of the dimensions is at least 100 millimeters, and consisting essentially of:

(a) from about 70% to about 95% by volume, based on the total volume of (a) and (b), of a homogeneous, grain boundary-free continuous phase vitreous carbon material; and



(b) from about 5% to about 30% by volume, based on the total volume of (a) and (b), of convoluted reinforcement fibers having a radius of curvature diameter ratio in the range of from about 5:1 to about 20:1.

5,182,167

Patent Not Issued For This Number

5,182,168

BIAXIALLY ORIENTED POLYPROPYLENE FILM

Shaw-Chang Chu, Cranbury, N.J., and Kevin A. Kirk, Macedon, N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 451,906, Dec. 18, 1989, abandoned. This application Oct. 9, 1991, Ser. No. 772,646
Int. Cl.[5] B32B *5/16, 27/08;* D02J *1/22*
U.S. Cl. 428—330 **22 Claims**

1. A biaxially oriented polypropylene film comprising

a longitudinally oriented film comprising polypropylene stretched from about 3 to about 7 times its original length and

a coating layer of an alkali metal salt of an alkyl sulfate wherein alkyl of the alkyl sulfate contains between about 4 to about 24 carbon atoms,

wherein said coating layer is provided on a surface of said longitudinally oriented film, prior to transverse orientation of the film, and

where said coating layer is effective to reduce the coefficient of friction of said surface in the biaxially oriented film, wherein the film, after transverse orientation, is free of optical flaw.

5,182,169

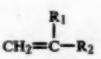
ANTISTATIC HIGHLY ADHESIVE FILM, PROCESS FOR PRODUCING SAID FILM, AND MAGNETIC CARD USING SAID FILM

Masayuki Fukuda, Sagamihara, and Sadayoshi Miura, Yamato, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 13, 1990, Ser. No. 626,891
Claims priority, application Japan, Dec. 14, 1989, 1-324262
Int. Cl.[5] C09J *7/02*
U.S. Cl. 428—343 **5 Claims**

1. An antistatic highly adhesive film having high adhesivity to an ultraviolet curing resin layer and a magnetic layer, and comprising a polyester film and an antistatic highly adhesive layer provided on at least one side of the polyester film, said adhesive layer comprising a copolymer (A) and a polymer (B) at a weight ratio of 95:5 to 50:50, the copolymer (A) having a second order transition temperature (Tg) of 10°–80° C. and being obtained by copolymerizing

(a) 70–99% by weight of a compound represented by the following formula (I)


(I)

wherein R_1 is a hydrogen atom or a methyl group; and R_2 is $-COOR_3$ in which R_3 is a straight or branched alkyl group of 1–20 carbon atoms, or R_2 is

or —C"N,

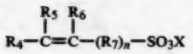
(b) 1–10% by weight of N-methylol(meth)acrylamide,

(c) 0–5% by weight of an ethylenic compound having a carboxy group in the molecule, other than the compound (A), and

(d) 0–29% by weight of another compound copolymerizable with the compounds (a) to (c), the total of (a) to (d) being 100% by weight,

and the polymer (B) having an molecular weight of 5,000 or more and being obtained by polymerizing or copolymerizing

(e) 30–100% by weight of a compound represented by the following formula (II)



(II)

wherein R_4, R_5 and R_6 are independently a hydrogen atom or a lower alkyl group; R_7 is a bivalent organic group; X is an alkali metal or $—NH(R_8)_3$ in which R_8 is a hydrogen atom or a lower alkyl group; and n is 0 or 1, and

(f) 0–70% by weight of another compound copolymerizable with the compound (e), the total of (e) and (f) being 100% by weight.

5,182,170

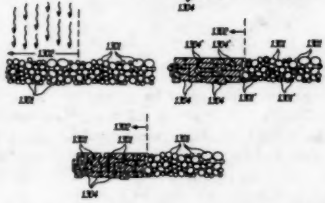
METHOD OF PRODUCING PARTS BY SELECTIVE BEAM INTERACTION OF POWDER WITH GAS PHASE REACTANT

Harris L. Marcus; Udaykumar Lakshminarayan, and David L. Bourell, all of Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 559,338, Jul. 30, 1990, Pat. No. 5,076,869, which is a continuation of Ser. No. 402,694, Sep. 5, 1989, Pat. No. 4,944,817. This application Apr. 26, 1991, Ser. No. 692,172

Int. Cl.[5] B22F *3/00;* **B32B** *19/00, 31/00;* **B23K** *26/00*

U.S. Cl. 428—551 **21 Claims**



17. A part produced by the method comprising the steps of:

depositing a powder onto a target surface, said powder comprising a first material;

exposing the powder to an atmosphere, said atmosphere comprising a reactant gas;

heating a selected portion of said powder in such a manner as to cause chemical interaction of said first material and said reactant gas, so that a cross-sectional region of the part is defined thereat by the formation of a mass of the product of said interaction.

5,182,171

CONDUCTIVE AND CORROSION-RESISTANT STEEL SHEET

Yuji Aoyama, and Katsutoshi Kumai, both of Funabashi, Japan, assignors to Taiyo Steel Co., Ltd., Tokyo, Japan

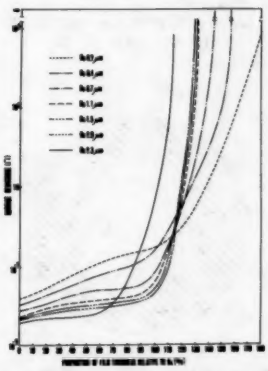
Continuation of Ser. No. 65,512, Jun. 23, 1987, abandoned. This application Jun. 16, 1989, Ser. No. 393,949

Claims priority, application Japan, Jun. 26, 1986, 61-150595

Int. Cl.[5] B32B *15/04*

U.S. Cl. 428—623 **15 Claims**

13. A conductive and corrosion-resistant steel sheet comprising a steel sheet material having an arithmetic average surface roughness (RA) of 0.01 to 2.0 μm, a coating film applied thereon and having a thickness of 18 to 110% of said Ra, and a chemical conversion treatment layer applied between said steel sheet material and said coating film, said coating film being made of a material selected from the group consisting of a melamine-alkyd resin, a polyester resin, an epoxy resin and a urethane resin and containing metallic particles in said material, said coating film providing corrosion-resistant properties and electrical conductivity such that current may pass from a



surface of said steel sheet material and a said chemical conversion treatment layer through the coating material.

5,182,172

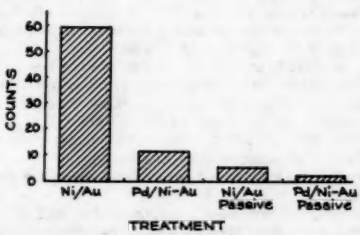
POST-PLATING PASSIVATION TREATMENT

John F. Tucker, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Apr. 18, 1991, Ser. No. 686,736

Int. Cl.[5] C23C *28/00*

U.S. Cl. 428—632 **7 Claims**



1. A method for reducing the corrosion of precious metal plated objects, the improvement comprising

electroplating an object with a primary nickel-containing plate,

electroplating the primary nickel-containing plate with the secondary nickel-palladium plate,

electroplating the secondary nickel-palladium plate with a precious metal plate, and

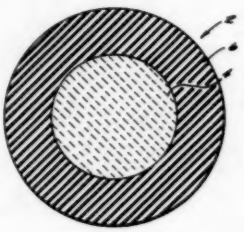
immersing the precious metal plated object in an aqueous solution containing about 1 gm/l to about 10 gm/l of ammonium dichromate at temperatures from about 20° C. to about 50° C. for a period of about 1 minutes to about 20 minutes.

7. An eyewear frame prepared by the method of claim 1.

5,182,173
COATED PARTICLES AND METHOD FOR MAKING SAME

Gwo Swei, Northborough, Mass., assignor to Rogers Corporation, Rogers, Conn.

Filed May 7, 1990, Ser. No. 519,943
Int. Cl.[5] B32B *25/20*
U.S. Cl. 428—391 **48 Claims**



1. A composite filler material comprising:
an inorganic core, and
a layer of crosslinked silicone elastomer covering the core and chemically bonded to the core wherein the crosslinked silicone elastomer comprises the reaction product of a multifunctionally terminated polysiloxane and a first multifunctional silane.

5,182,174
FLEXIBLE ETCH-RESISTANT FINISHES WITH SILOXANE CROSS-LINKING

Maurice A. S. Stephenson, Philadelphia, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 13, 1991, Ser. No. 699,344
Int. Cl.[5] B32B *9/06*
U.S. Cl. 428—450 **15 Claims**

1. A coating composition useful for coating a substrate, which comprises:
(a) from about 2 to 40% by weight, based on the weight of the binder solids, of an organosilane polymer having a weight average molecular weight of about 500–30,000 and which is the polymerization product of about 30–95% by weight ethylenically unsaturated non-silane containing monomers and about 5–70% by weight ethylenically unsaturated silane containing monomers, based on the weight of the organosilane polymer;
(b) from about 30 to 70% by weight, based on the weight of binder solids, of a polyester or a copolymer thereof having a hydroxyl number of about 10–200 and a weight average molecular weight of about 6,000–30,000;
(c) from about 20 to 40%, based on the weight of the binder solids, of an amino resin crosslinking agent;
(d) from about 1 to 15% of one or more silsesquioxane compounds;
(e) an effective amount of a curing catalyst; and
(f) from about 20 to 80% by weight, based onthe weight of the composition, of a liquid organic carrier.

5,182,175
RECORDING MEDIUM

Mamoru Sakaki, Sagamihara; Tomomi Nakatsugawa, Kawasaki, and Hiroshi Sato, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1990, Ser. No. 503,741
Claims priority, application Japan, Apr. 3, 1989, 1-85192
Int. Cl.[5] B41M *5/00*
U.S. Cl. 428—537.5 **9 Claims**

1. A recording medium comprising a substrate, and an ink-receiving layer provided thereon, said ink-receiving layer being a layer manually comprising a pigment, and said ink-receiving layer containing a water-insoluble and amorphous basic aluminum salt, wherein the amount of the basic aluminum salt is in a range of from 5 to 35 parts by weight per 100 parts by weight of pigment in the ink-receiving layer, and wherein the basic aluminum salt is represented by the general formula (I) below:

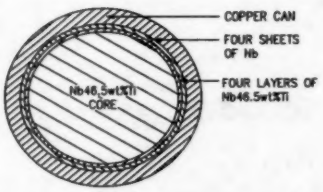
$$Al_x(OH)_yX_z \quad (I)$$

where x, y and z are respectively positive integers and satisfy the relations of $z=3x-y$, and $x/z \geqq 3$, and X is an acid radical.

5,182,176
EXTRUDED WIRES HAVING LAYERS OF SUPERCONDUCTING ALLOY AND REFRACTORY MEAL ENCASED IN A NORMAL METAL SHEATH

James Wong, Wayland, Mass., assignor to Composite Materials Technology, Inc., Shrewsbury, Mass.

Continuation-in-part of Ser. No. 525,124, May 17, 1990. This application Oct. 30, 1990, Ser. No. 605,926
Int. Cl.[5] H01B *12/00*; H01L *39/00*
U.S. Cl. 428—930 **4 Claims**

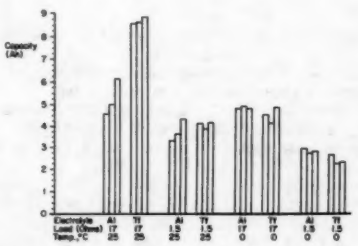


1. A superconducting filament comprising a NbTi superconducting alloy core surrounded by at least two separate layers of NbTi alloy, a refractory metal barrier surrounding said layers and a normal metal sheath surrounding said barrier, said sheath, layers and core being metallurgically bonded by co-reduction of at least 10 times, the concentration of Ti in said separate layer being higher than in said core.

5,182,177
PRIMARY CELL HAVING MINIMIZED DROP IN THE START-UP POTENTIAL

Carl R. Schlaikjer, Concord, Mass., assignor to Battery Engineering, Inc., Hyde Park, Mass.

Filed Feb. 20, 1992, Ser. No. 837,956
Int. Cl.[5] H01M *6/12*
U.S. Cl. 429—48 **21 Claims**



1. An electrochemical cell having an anode, a non-aqueous oxyhalide electrolyte and an electrolyte salt, and a cathode, comprising the addition to the oxyhalide of an electrolyte salt that contains at least a partially substituted product that results from reacting a chloride selected from the group consisting of

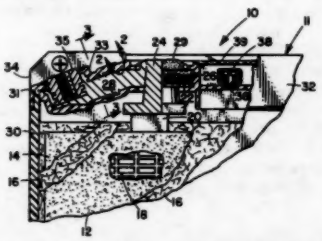
aluminum chloride and lithium aluminum chloride with lithium triflate.

5,182,178

SUPPRESSION OF ELECTROLYTE LEAKAGE FROM THE TERMINAL OF A LEAD-ACID BATTERY

J. David Brizendine, Lee's Summit, and John Hooke, Warrensburg, both of Mo., assignors to Gates Energy Products, Inc., Gainesville, Fla.

Filed May 21, 1992, Ser. No. 887,437
Int. Cl.[5] H01M *2/24*
U.S. Cl. 429—160 7 Claims



1. In a lead-acid cell having a container in which is positioned at least one positive electrode plate, at least one negative electrode plate, a separator interposed between the electrode plates, an acid electrolyte absorbed in the electrode plates and separator, and a through connector formed of lead joining the electrode plate(s) of one polarity to a terminal of the cell through a plastic partition wall portion of the container, the improvement comprising:

the through connector has rounded edges and is insert molded in the plastic partition wall, the lead of the connector and plastic of the partition wall having substantially different thermal coefficients of expansion, and the connector is provided on its outer surface with a layer of elastic adhesive material bonded thereto and which makes sealing contact with both the connector and the surrounding plastic partition wall at substantially varying ambient temperatures, and which suppresses creepage of electrolyte along the interface defined between the connector and partition wall.

5,182,179

FIBER BINDER

Charles T. Arkens, Hatfield; Reginald T. Smart, Horsham, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 7, 1990, Ser. No. 624,178
Int. Cl.[5] H01M *2/16*
U.S. Cl. 429—254 6 Claims

1. A composition comprising:

(a) textile fibers,

(b) a stabilizing ionic surfactant,

(c) a counterion to the stabilizing surfactant,

(d) a nonionic surfactant and

(e) a multi-stage, water-insoluble polymer, wherein said polymer comprises a first stage copolymer and a second stage copolymer, where said first stage copolymer is formed from at least one hydrophobic monomer and at least one polyfunctional monomer, and where the first stage copolymer is acid-resistant and has a glass transition temperature greater than about 80° C. and where said second stage copolymer is acid-resistant and coagulable.

5,182,180

DRY FILM PROCESS FOR ALTERING THE WAVELENGTH OF RESPONSE OF HOLOGRAMS

William J. Gambogi, Jr., and Robert G. Melega, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 27, 1991, Ser. No. 758,270
Int. Cl.[5] G03H *1/04, 1/18*
U.S. Cl. 430—1 11 Claims

1. A process for forming a multicolor volume phase hologram in a substantially solid, transparent, photosensitive film element comprising:

(a) holographically exposing said film element to coherent light to record a volume hologram within said element;

(b) imagewise exposing a solid diffusing element containing monomer to actinic radiation to partially polymerize said monomer;

(c) contacting said film element with said diffusion element for at time sufficient to selectively modify the wavelength of light response by the hologram by the diffusion of monomer from said diffusion element, thereby forming a multicolor hologram, and

(d) polymerizing the monomer that has diffused into said film element during step (c).

5,182,181

RESIN COATED CARRIERS FOR ELECTROSTATIC IMAGE DEVELOPMENT AND THE METHOD OF PREPARING THE SAME

Yoshiaki Koizumi; Kenji Tsujita; Shigenori Kouno, and Ken Ohmura, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 15, 1991, Ser. No. 670,304
Claims priority, application Japan, Mar. 20, 1990, 2-68202
Int. Cl.[5] G03G *9/113*
U.S. Cl. 430—108 10 Claims

1. A carrier for electrostatic image development comprising a resin coated carrier particle which comprises a core particle and a resin coated on the surface thereof, whose resin is coated by a dry method with secondary particles composed of elementary resin particles with a volume average particle size of not more than 0.5 μm that are fused on their surface, wherein the secondary particles have

BET specific surface areas of 5 to 150 m^2/g; and a volume average particle size of 1.5 to 5.0 μm.

5,182,182

ELECTROPHOTOGRAPHIC IMAGE-FORMING METHOD

Kazuhito Takaoka, Kadoma; Masatoshi Uehara, Hirakata, and Yumiko Sano, Ibaraki, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 26, 1990, Ser. No. 558,240
Claims priority, application Japan, Jul. 31, 1989, 1-198523
Int. Cl.[5] G03G *13/14*
U.S. Cl. 430—124 1 Claim

1. An electrophotographic image-forming method comprising the steps of:

(a) forming a thin layer comprising photosensitive toner charged to have a given polarity on a conductive drum,

(b) exposing said thin layer to light according to image information,

(c) pressing a roller-type transfer electrode comprising a conductive roller having a conductive elastic rubber surface against said toner thin layer through a transfer material at a contact pressure of 0.5 to 1.8 Kgf/cm^2 after said step (b) to transfer a part of said photosensitive toner onto said transfer material, and

(d) maintaining the contact between said toner thin layer on the conductive drum and said transfer material for a period of 0.1 to 2 seconds by applying a pushing pressure with

a pushing-up member after said transfer material passes said roller-type transfer electrode.

5,182,183

POSITIVE PHOTOSENSITIVE PLANOGRAPHIC PRINTING PLATES CONTAINING SPECIFIC HIGH-MOLECULAR WEIGHT COMPOUND AND PHOTOSENSITIVE ESTER OF O-NAPTHOQUINONEDIAZIDOSULFONIC ACID WITH POLYHYDROXYBENZOPHENONE

Hiroshi Tomiyasu, Tokyo; Yoshiko Kobayashi, Yokohama; Kiyoshi Goto, Tokyo; Takeshi Yamamoto, and Hideyuki Nakai, both of Tokyo, all of Japan, assignors to Mitsubishi Kasei Corporation and Konica Corporation, both of Tokyo, Japan

Continuation of Ser. No. 508,531, Apr. 12, 1990, abandoned, which is a continuation of Ser. No. 167,107, Mar. 11, 1988, abandoned. This application Nov. 8, 1991, Ser. No. 789,550

Claims priority, application Japan, Mar. 12, 1987, 62-57282; May 7, 1987, 62-111413; May 18, 1987, 62-120592; Jun. 3, 1987, 62-139140

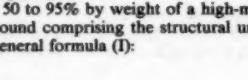
Int. Cl.[5] G03F *7/023;* G03C *1/61*

U.S. Cl. 430—165 **17 Claims**

1. A positive photosensitive planographic printing plate comprising a support with a photosensitive layer thereon, said photosensitive layer consisting essentially of in admixture:

(A) 5 to 50% by weight of a photosensitive ester of o-naphthoquinonediazidosulfonic acid and a polyhydroxybenzophenone; and

(B) 50 to 95% by weight of a high-molecular weight compound comprising the structural unit represented by the general formula (I):



(I)

wherein R^1 and R^2 represent independently a hydrogen atom, a halogen atom, a alkyl group, an aryl group or a carboxyl group; R^3 represents a hydrogen atom, a halogen atom, an alkyl group or an aryl group; R^4 represents a hydrogen atom, an alkyl group, an aryl group or an aralkyl group; Y represents an aromatic group which may be substituent(s); X represents a divalent organic group linking the nitrogen atom and a carbon atom of said aromatic group; m represents an integer of 0 or 1; and n represents an integer from 0 to 5.

5,182,184

NOVOLAK RESINS OF LOWERED HYDROXYL CONTENT AND HIGH CONTRAST HIGH THERMAL STABILITY POSITIVE PHOTORESISTS PREPARED THEREFROM

Richard M. Lazarus, Mission Viejo; Randall Kautz, Irvine, and Sunit S. Dixit, Mission Viejo, all of Calif., assignors to Morton International, Inc., Chicago, Ill.

Filed Feb. 5, 1990, Ser. No. 475,402

Int. Cl.[5] C03F *7/023;* G03C *1/76;* C08G *8/04, 14/04*

U.S. Cl. 430—165 **20 Claims**

3. A substrate coated with a thermally stable and highly resolved, exposed resist pattern, said resist pattern being formed from a positive photoresist composition which, prior to exposure to actinic radiation, comprises a bindingly effective amount of a esterified novolak resin and a photoimaging amount of photosensitizer; wherein the novolak resin comprises the condensation product of:

(a) a mixture of m- or p-cresol and

(b) a mixture of aldehydes comprising (1) formaldehyde or a formaldehyde precursor and (2) a monohydroxy aromatic aldehyde selected from the group consisting of 2-hydroxybenzaldehyde, 3-hydroxybenzladehyde and 4-hydroxybenzaldehyde,

wherein said novolak resin has hydroxyl groups thereof esterified so that an aliphatic or aromatic ester group exists in place of the hydrogen atom in at least a portion of the hydroxyl gruops, whereby said novolak resin has a hydroxyl number in the range of from about 120 to about 180 grams of resin per equivalent of hydroxyl.

5,182,185

DEEP U.V. PHOTORESIST COMPOSITIONS CONTAINING 4-TERT-BUTYLSTYRENE/MALEIMIDE COPOLYMER AND POLYCYCLIC CYCLOPENTANE-2-DIAZO-1,3-DIONE AND ELEMENTS UTILIZING THE COMPOSITIONS

Chengjiu Wu, Morristown; Anne Mooring, Randolph, and James T. Yardley, Morristown, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 373,358, Jun. 29, 1989, Pat. No. 5,039,596. This application Apr. 30, 1991, Ser. No. 693,513

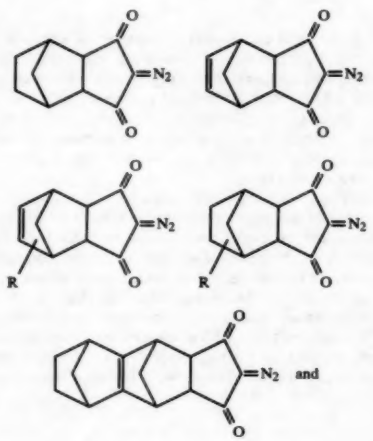
Int. Cl.[5] G03F *7/023;* G03C *1/61*

U.S. Cl. 430—165 **7 Claims**

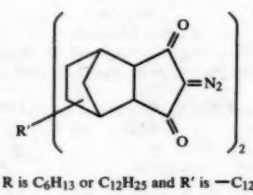
1. A photosensitive composition comprising in admixture:

(a) from about 65% to about 98% based on the weight of the non-solvent parts of the composition of 4-tert-butylstyrene/maleimide copolymer binder resin; and

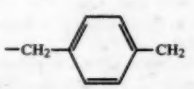
(b) from about 2% to about 35% based on the weight of the non-solvent parts of the composition of a component selected from the group consisting of



and



wherein R is C_6H_{13} or $C_{12}H_{25}$ and R' is $-C_{12}H_{24}-$ or

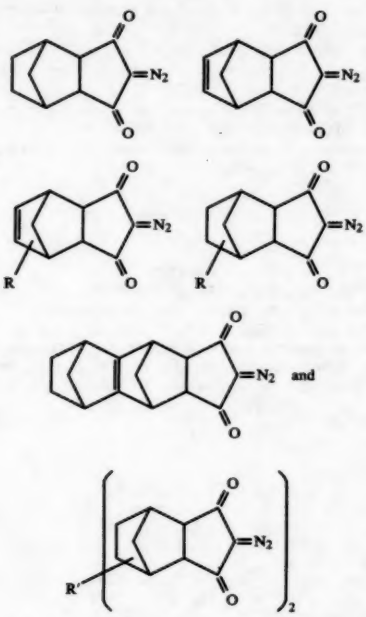


(c) a solvent selected from the group consisting of diglyme, propylene glycol monoalkyl ether and propylene glycol monoalkyl ether acetate in an amount sufficient to form a substantially uniform admixture of the composition components.

4. A photographic element which comprises a substrate and a dried photosensitive composition substantially uniformly coated on said substrate which photosensitive composition comprises in admixture;

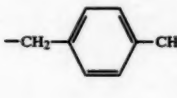
(a) from about 65% to about 98% based on the weight of the non-solvent parts of the composition of 4-tert-butyl-styrene/maleimide copolymer; and

(b) from about 2% to about 35% based on the weight of the non-solvent parts of the composition of a component selected from the group consisting of



and

wherein R is C_6H_{13} or $C_{12}H_{25}$ and R' is $-C_{12}H_{24}-$ or



5,182,186

OPTICAL INFORMATION RECORDING MEDIUM

Yoshio Inagaki; Keiichi Adachi, both of Minami-ashigara, and Masao Yabe, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

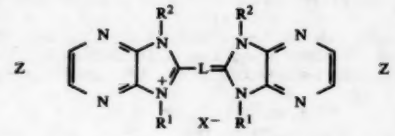
Continuation-in-part of Ser. No. 251,137, Sep. 29, 1988, abandoned. This application Mar. 20, 1990, Ser. No. 496,320

Claims priority, application Japan, Sep. 29, 1987, 62-245288

Int. Cl.[5] G03C *1/72*; G11B *7/24*

U.S. Cl. 430—270 **19 Claims**

1. An optical information recording medium for carrying out recording or readout by laser beam which comprises a support having carried thereon a recording layer containing dye(s) represented by the general formula (I):



wherein R^1 and R^2 independently represent substituted or unsubstituted alkyl groups, L represents a linking group formed by linkage of 5 substituted or unsubstituted methine groups through conjugated double bonds, Z represents an atomic group for completing an unsubstituted benzene ring and X^- is a halogen ion, SO_4^{2-}, HSO_4^-, an alkylsulfate ion, a sulfonate ion, a carboxylate ion, PF_6^-, BF_4^-, ClO_4^-, IO_4^-, a tungstate ion, a heteropolyacid ion, $H_2PO_4^-$, NO_3^- or a phenolate ion for neutralization of electron charge of the cationic part wherein the reflectance of the optical information recording medium, at least one point of the wavelength region of 750 to 850 nm, is 60% or more.

5,182,187

RADIATION-POLYMERIZABLE COMPOSITION AND RECORDING MATERIAL PREPARED FROM THIS COMPOSITION

Ulrich Geissler, Hochheim, and Hartmut Wiezer, Eppstein-Vockenhausen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 310,239, Feb. 14, 1989, abandoned. This application Nov. 26, 1990, Ser. No. 617,378

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805706

Int. Cl.[5] G03C *1/795, 1/77*; G03F *7/033*

U.S. Cl. 430—271 **16 Claims**

1. A radiation-polymerizable composition comprising

a) from about 20 to 60% by weight of a constituent which can undergo free-radical polymerization contains at least one terminal ethylenically unsaturated group and has a boiling point above 100° C. under normal pressure, wherein said constituent contains at least 40%, based on the total amount of said constituent, of compounds having at least one urethane group in the molecule,

b) from about 0.01 to 10% by weight of a compound which is capable of initiating the polymerization of constituent (a), under the action of actinic radiation, and

c) from about 40 to 80% by weight of a saturated copolymer which is insoluble in water and soluble in organic solvents and in aqueous-alkaline solutions, and which comprises

c1) from 12 to 27% by weight of units of acrylic acid or methacrylic acid,

c2) from about 20 to 50% by weight of methyl methacrylate, and

c3) from about 15 to 50% by weight of an alkyl acrylate, having from 4 to 8 carbon atoms in the alkyl gruop, and

c4) from about 1 to 20% by weight of a substituted or unsubstituted styrene,

and has an acid number of about 78 to 176 and a glass transition temperature of about 290 to 340K. wherein the product obtained by multiplying the difference of the glass transition temperatures of the units c2 and c3 in Kelvin by the amount of unit c3 in per cent is at least 4000.

9. A radiation-sensitive recording material comprising a support and a radiation-sensitive layer which comprises a composition as claimed in claim 1.

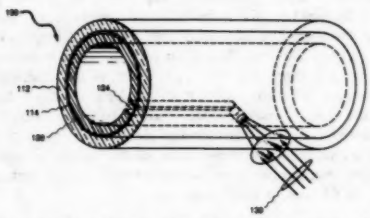
11. A recording material as claimed in cliam 9, wherein said support has a surface comprising a plastic film.

5,182,188

METHOD OF DEVELOPING A SELF-DEVELOPING RESIST

Herbert S. Cole, Jr., Scotia; James W. Rose, Delmar; Renato Guida, Wynantskill, and Yung S. Liu, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 29, 1990, Ser. No. 546,230
Int. Cl.[5] G03F *7/36*
U.S. Cl. 430—323 **16 Claims**



11. A method of forming a pattern on the inside of a hollow opaque body comprising the steps of:

(a) coating the inside of said body with a layer of self-developing photoresist;

(b) directing a beam of light onto the exterior surface of said body in a pattern determined by the pattern to be formed on the inside of said body, said beam of light having a frequency which said body absorbs and having sufficient energy density to heat the inner surface of said body to the thermal decomposition temperature of said self-developing photoresist to volatilize the photoresist disposed on the illuminated portions of the body;

(c) performing a process which affects the characteristics of the inner surface of said body in the areas which were exposed by the volatilization of said self-developing photoresist.

14. The method recited in claim **11** wherein:

said process performed in step (c) is a subtractive process.

15. The method recited in claim **14** wherein:

said subtractive process comprises etching.

5,182,189

INCREASED PHOTOGRAPHIC ACTIVITY PRECIPITATED COUPLER DISPERSIONS PREPARED BY COPRECIPITATION WITH LIQUID CARBOXYLIC ACIDS

Pranab Bagchi, Webster, and Steven J. Sargeant, Honeoye Falls, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 442,827, Nov. 29, 1989, Pat. No. 5,104,776. This application Oct. 11, 1991, Ser. No. 774,905
Int. Cl.[5] G03C *5/26*
U.S. Cl. 430—449 **5 Claims**

1. A composition consisting of coupler particles, surfactant, and a liquid carboxylic acid.

5,182,190

METHOD FOR OBTAINING A PHOTOGRAPHIC COATING COMOPSITION

Jacques Le Faou, Chalon sur Saone, and Jean-Claude Hervieux, Chatenoy le Royal, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/EP89/00016, § 371 Date Sep. 14, 1990, § 102(e) Date Sep. 14, 1990, PCT Pub. No. WO89/06829, PCT Pub. Date Jul. 27, 1989
PCT Filed Jan. 6, 1989, Ser. No. 548,877
Claims priority, application France, Jan. 18, 1988, 88 00750
Int. Cl.[5] G03C *1/06, 1/025*
U.S. Cl. 430—546 **10 Claims**

1. A method for preparing a photographic composition for a coating layer having a desired formulation, said formulation containing at least a silver halide emulsion and chemical addenda, and gelatin, the method comprising in order the following steps:

1)(a) preparing individually a plurality of components of the desired formulation, said components being selected from (i) silver halide emulsions, or (ii) materials selected from the group consisting of solutions or dispersions of chemical addenda and gelatin, and

1)(b) separately solidifying each of said plurality of components by chilling;

2) separately cutting each of said plurality of components into chunks;

3) selecting the amount of chunks from step 2 of each of said plurality of components so as to produce the desired formulation of the coating layer;

4) cold blending, in a solid state, the chunks of said plurality of components selected from step 3;

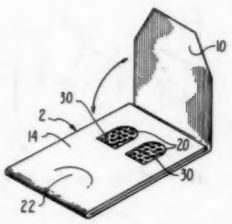
5) liquefying the resulting blend obtained in step 4 prior to feeding it into a coating station.

5,182,191

OCCULT BLOOD SAMPLING DEVICE AND ASSAY

Eugene Fan, La Jolla; Fon-Chiu M. Chen, San Diego; Michael W. Milner, San Diego, and Leslie J. Rehg, San Diego, all of Calif., assignors to Pacific Biotech, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 258,036, Oct. 14, 1988, abandoned. This application Sep. 21, 1989, Ser. No. 409,003
Int. Cl.[5] G01N *33/535, 33/543*
U.S. Cl. 435—7.9 **29 Claims**



1. A sampling folder for use in the collection of a specimen, comprising:

a front panel,

a back panel,

a sample collecting panel at least partially covered by said front panel and having a specimen application area thereon, and

a specimen receiving panel covered by said sample collecting panel,

all of said panels being in overlying relationship, said front panel being openable to permit application of a specimen to said specimen application area;

said specimen receiving panel comprising, at least in part, a detachable sample transferring stick having a handle portion and a sample collecting portion,

said sample transferring stick positioned such that the sample collecting portion of said sample transferring stick is located underneath said specimen application area of said sample collecting panel and said handle portion is located under a part of said specimen receiving panel other than said specimen application area,

and wherein said back panel includes an opening therein through which said handle portion of said stick can be grasped and said stick can be removed.

5,182,192

MONOCLONAL ANTIBODIES AGAINST GLYCOLIPID ANTIGENS, METHODS OF PRODUCING THESE ANTIBODIES, AND USE THEREFOR

Zenon Steplewski, Malvern; Hilary Koprowski, Wynnewood, and Magdalena Thurin, Philadelphia, all of Pa., assignors to The Wistar Institute, Philadelphia, Pa.

Division of Ser. No. 30,537, Mar. 27, 1987, Pat. No. 4,971,792. This application Aug. 6, 1990, Ser. No. 564,115

Int. Cl.[5] G01N *33/574;* A61K *49/00*

U.S. Cl. 435—7.23 6 Claims

1. An in vitro method of screening to aid in the diagnosis of adenocarcinoma by detecting the presence of difucosyl blood group antigens Y-6 and B-7-2 expressed by adenocarcinoma which comprises contacting a sample with a diagnostically effective amount of detectably labeled monoclonal antibody which binds to the same epitope as the monoclonal antibody produced by a cell line selected from the group consisting of ATCC HB 9324 and ATCC HB 9347 and determining the binding of said monoclonal antibody with said antigens wherein the presence of said binding is indicative of the presence of adenocarcinoma expressing said antigens.

5,182,193

METHOD FOR MEASURING BIOMASS

Ken Mishima, Toyonaka; Akio Mimura, Fuji; Yoshimasa Takahara, Narashino; Kouji Asami, Kyoto, and Tetsuya Hanai, Uji, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 150,047, Jan. 29, 1988, abandoned. This application Nov. 12, 1991, Ser. No. 790,071

Claims priority, application Japan, Feb. 4, 1987, 62-22481; Sep. 9, 1987, 62-224018; Nov. 6, 1987, 62-279060

Int. Cl.[5] C12Q *1/02*

U.S. Cl. 435—29 5 Claims

1. A method for determining a biomass of organisms, which comprises:

measuring an electric capacitance at a frequency of 100 kHz to 10 MHz across at least one pair of electrodes installed in a bioreactor, and

determining, according to the electric capacitance measured, the biomass of organisms in the bioreactor by a predetermined relationship between the biomass and the electric capacitance.

5,182,194

METHOD FOR PREPARING P-MENTHA-8-THIOL-3-ONE

Antonius Kerkenaar, Blaricum; Diederik J. M. Schmedding, Driebergen, and Jan Berg, Nieuwegein, all of Netherlands, assignors to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappe Lijk Onderzoektno, The Hague, Netherlands

Filed Jan. 26, 1988, Ser. No. 148,418

Claims priority, application Netherlands, Jan. 30, 1987, 8700240

Int. Cl.[5] C12P *11/00, 7/26;* C12N *9/88;* C07C *319/02*

U.S. Cl. 435—130 2 Claims

1. A method for preparing thiol compounds comprising reacting cysteine non-enzymatically with pulegone to form a cysteine conjugate compound, subsequently reacting the cysteine conjugate so obtained with β-lyase selected from the group consisting of *Eubacterium limosum, Fusobacterium necrophorum* and *Fusobacterium varium* β-lyases to form p-mentha-8-thiol-3-one and recovering said p-mentha-8-thiol-3-one.

5,182,195

METHOD FOR INCREASING GENE EXPRESSION USING PROTEASE DEFICIENT YEASTS

Kazuo Nakahama, Nagaokakyo; Yoshihiko Kaisho, Sakai, and Koji Yoshimura, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 9, 1988, Ser. No. 269,140

Claims priority, application Japan, Nov. 13, 1987, 62-285175

Int. Cl.[5] C12N *1/19;* C12P *21/02*

U.S. Cl. 435—69.1 7 Claims

1. Respiratory-deficient yeast excluding *Saccharomyces cerevisiae* AH22R$^-$, said respiratory-deficient yeast being transformed with a DNA containing a gene encoding a protein foreign to yeast and capable of expressing a foreign DNA, wherein the yeast is *Saccharomyces cerevisiae* NA74-3A(ρ^-), *Saccharomyces cerevisiae* K33-7B(ρ^-), *Saccharomyces cerevisiae* NAX-50D(ρ^-), *Saccharomyces cerevisiae* NA74-3A(ρ^-)/pTFL710T, *Saccharomyces cerevisiae* NA74-3A(ρ^-)/pPFL725T, *Saccharomyces cerevisiae* NA74-3A(ρ^-)/pGFE313, or *Saccharomyces cerevisiae* NAX-50D(ρ^-)/pTFL710T.

5. Yeast as claimed in claim 1, wherein the gene is a gene encoding at least one of human lysozyme, protein disulfide isomerase, protein kinase C, huma EGF, basic FGF, nerve growth factor, growth hormone, insulin, interferon α, interferon β, interferon γ, interleukin 2, hepatitis B virus surface antigen, HTLV-1 or lymphotoxin.

5,182,196

EXPRESSION SYSTEMS FOR OVERPRODUCTION OF DESIRED PROTEINS

Bernard Allet, Onex, and Eric H. Kawashima, Geneva, both of Switzerland, assignors to Biogen, Inc., Cambridge, Mass.

Continuation of Ser. No. 53,398, May 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 785,847, Oct. 9, 1985, abandoned. This application Jun. 27, 1989, Ser. No. 372,281

Int. Cl.[5] C12P *21/02;* C12N *15/70, 1/21*

U.S. Cl. 435—69.5 13 Claims

1. A method for improving the expression of a non-bacteriophage T4 protein comprising culturing a prokaryotic host transformed with a recombinant DNA molecular capable of directing expression of said non-bacteriophase T4 protein in high yields in said prokaryotic host, said recombinant DNA molecule comprising the following elements, operatively linked in the following order, 5' to 3': DNA sequence I, DNA sequence X, DNA sequence coding for a non-bacteriophage T4 protein, wherein said DNA sequence I consists of:

CGATGGTAAAGTATTTCAA
CTCAGGTTGGATACCTCTCGAAG
ACCCAGAGTATTGCGAATTATGCCAGCTATG
AGGTAAAGTGTCATAGCACCA
ACTGTTAATTAAATTAAATTAAAAAGGAAAT,

said DNA sequence X comprises a DNA sequence selected from the group consisting of CGATACT, CGCGATACT, ATACTAAA, ATACT, OGCGATACTAAA, CGATACTAA and CGATTCC and said non-bacteriophase T4 protein is selected from the group consisting of human interleukin 2 and human tumor necrosis factor.

5,182,197

MICROBIOLOGICAL PROCESS FOR THE PRODUCTION OF 6-HYDROXYPICOLINIC ACID

Andreas Kiener, Visp; Rainer Glockler, and Klaus Heinzmann, both of Visperterminen, all of Switzerland, assignors to Lonza Ltd., Basel, Switzerland

Filed Feb. 4, 1992, Ser. No. 830,844

Claims priority, application Switzerland, Feb. 4, 1991, 330/91

Int. Cl.[5] C12P *17/12;* C12R *1/01, 1/05*

U.S. Cl. 435—122 4 Claims

1. A microbiological process for the production of 6-hydrox-

ypicolinic acid, characterized in that picolinic acid and/or at least one of its salts are hydroxylated by microorganism *Alcaligenes faecalis*, deposited in the DSM under number 6269, or one of its descendants or mutants, which grows with picolinic acid as sole carbon, nitrogen and energy source, and that the concentration of the picolinic acid and/or at least one of its salts is selected so that the 6-hydroxypicolinic acid is not further metabolized.

5,182,198

PROCESS FOR PREPARING (+)-HOMOPILOPIC ACID

Shoichi Kise; Mikio Hayashida; Aiichiro Ori; Junzou Hiratsuka, all of Yamaguchi, and Hideaki Yamada, Kyoto, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

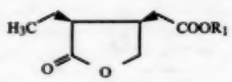
Filed Nov. 16, 1990, Ser. No. 614,132

Claims priority, application Japan, Nov. 22, 1989, 1-302273

Int. Cl.[5] C12P *17/04;* **C12N** *9/18, 9/20;* **C12R** *1/845*

U.S. Cl. 435—126 **23 Claims**

1. A process for preparing (+)-homopilopic acid and salts thereof, which comprises hydrolyzing a mixture of (+)-homopilopic acid ester of the general formula (I):



[I]

wherein R_1 denotes a straight or branched C_1–C_{10} hydrocarbon, and (−)-homopilopic acid ester of the general formula (II):

[II]

wherein R_2 denotes a straight or branched C_1–C_{10} hydrocarbon, in the presence of a microorganism selected from the group consisting of *Escherichia coli* IFO 3366, *Nocardia rubropertincta* FERM BP-3641, *Bacillus subtilis* IFO 3108, *Brevibacterium ketoglutamicum* ATCC 15588, and *Rhizomucor miehei* IFO 9740, or a crude enzyme solution thereof obtained by disrupting cells of said microorganism wherein said crude enzyme solution contains at least one enzyme selected from the group consisting of a lipase, an esterase, a cholesterol esterase, and a lipoprotein lipase.

5,182,199

THERMOPHILIC ETHANOL PRODUCTION IN A TWO-STAGE CLOSED SYSTEM

Brian S. Hartley, Grove Cottage, Smith Street, Elsworth, Cambridge, England CB3 8HY

PCT No. PCT/GB88/00411, § 371 Date Nov. 27, 1989, § 102(e) Date Nov. 27, 1989, PCT Pub. No. WO88/09379, PCT Pub. Date Dec. 1, 1988

Continuation of Ser. No. 435,480, Nov. 27, 1989, abandoned.

This PCT application May 24, 1988, Ser. No. 742,515

Claims priority, application United Kingdom, May 27, 1987, 8712410

Int. Cl.[5] C12P *7/14, 7/06, 7/08*

U.S. Cl. 435—162 **9 Claims**

1. A two-stage closed system process for the production of ethanol comprising

(i) carrying out ethanol-producing anaerobic fermentation of sugars in an anaerobic fermentation medium at a temperature of at least about 70° C. in the presence of a thermophilic, facultatively anaerobic bacterium capable of fermenting sugars both aerobically and anaerobically and producing ethanol in anaerobic fermentation at temperatures 70° C. or above;

(ii) continuously removing ethanol during anaerobic fermentation (i);

(iii) continuously withdrawing a portion of the fermentation medium from anaerobic fermentation (i);

(iv) separating bacteria from the withdrawn fermentation medium and recycling the separated bacteria to anaerobic fermentation (i);

(v) removing ethanol from the withdrawn portion of the fermentation medium;

(vi) adding the ethanol free fermentation medium to an aerobic reactor and culturing the bacteria, returning a portion of the resulting bacteria and the medium to the anaerobic fermentation medium of anaerobic fermentation (i) so as to maintain catalytic biomass.

5,182,200

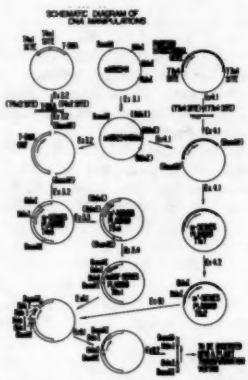
T-DNA PROMOTERS

Jerry L. Slightom, Kalamazoo, Mich., and David A. Tepfer, Paris, France, assignors to Lubrizol Genetics, Inc., Boulder, Colo.

Filed Apr. 22, 1985, Ser. No. 725,368

Int. Cl.[5] C12N *15/00, 5/00;* **C12R** *1/41;* **C12P** *21/00;* **C07H** *15/12*

U.S. Cl. 435—172.3 **30 Claims**



1. A method of genetically modifying a plant cell comprising the step of transforming the cell to contain a pRi T_L-DNA promoter from a gene selected from the group consisting of genes for T_L-DNA ORFS 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17 and a heterologous structural gene wherein said structural gene is not natively under control of said promoter, the promoter and the structural gene being in such position and orientation with respect to one another than the structural gene is expressible in a plant cell under control of the promoter.

5,182,201

LIPASE IMMOBILIZATION WITHOUT COVALENT BONDING ON AN AMPHIPHILIC SUPPORT CONTAINING LIPOPHILIC ALKYL CHAINS

Yoshihisa Tsuda, Wilmette, Ill., assignor to UOP, Des Plaines, Ill.

Filed Oct. 26, 1990, Ser. No. 604,038

Int. Cl.[5] C12N *11/14, 11/08, 11/06;* **C12P** *7/64*

U.S. Cl. 435—176 **33 Claims**

1. A method of making an amphiphilic support matrix for the immobilization of lipophilic biologically active materials without covalent bonding comprising impregnating a hard, incompressible porous particle with a hydrophilic polyamine, to provide a coating of hydrophilic polyamine on the particle reacting the hydrophilic polyamine coating with a monofunc-

tional, saturated aliphatic aldehyde containing a lipophilic alkyl chain of at least 5 carbon atoms, to convert the hydrophilic polyamine coating to a hydrophobic coating while retaining hydrophilic sites to produce an amphiphilic support matrix removing unreacted aldehyde, and recovering the resulting amphiphilic support matrix.

5,182,202

PURIFIED LUCIFERASE FROM *LUCIOLA CRUCIATA*

Naoki Kajiyama, Noda; Tsutomu Masuda, Needham, Mass.; Hiroki Tatsumi, Noda, and Eiichi Nakano, Iwatsuki, both of Japan, assignors to Kikkoman Corporation, Noda, Japan

Continuation of Ser. No. 274,861, Nov. 22, 1988, abandoned. This application Aug. 5, 1991, Ser. No. 742,477

Claims priority, application Japan, Nov. 30, 1987, 62-300022

Int. Cl.[5] C12N *9/02*; C12Q *1/66*

U.S. Cl. 435—189 **1 Claim**

1. A purified luciferase from *Luciola cruciata* characterized as follows:

(a) action:

said purified luciferase is derived from *Luciola cruciata* and catalyzes the oxidation of luciferin by an oxygen molecule, as shown by the enzymatic reaction formula:

$$\text{Luciferen} + \text{ATP} + O_2 \rightarrow \text{Oxyluciferin} + \text{AMP} + \text{pyrophosphoric acid} + CO_2 + \text{light};$$

(b) optimum pH, and pH range for stability:

the optimum pH is 8.0 to 9.5, and the pH range for stability is 6.5 to 9.0; and

(c) substrate specificity:

the luciferase does not act on ADP, CTP, UTP and GTP; said purified luciferase having the purity of luciferase purified from *L. cruciata* by:

dissolving the precipitate formed at 30 to 60% ammonium sulfate saturation from crude L. cruciata luciferase enzyme solution in a solution prepared by adding ethylenediaminetetraacetate to 1mM and ammonium sulfate to 10% to 25mM tris(hydroxy)aminomethane-hydrochloric acid buffer, pH=7.8;

subjecting said dissolved precipitate solution to gel filtration chromatography and recovering the active fraction;

dialyzing said active fraction against a buffer solution prepared by adding 0.1 M sodium chloride and 10% (V/V) ethylene glycol to a 10 mM sodium hydrogen phosphate-sodium dihydrogenphosphate solution;

adsorbing said dialyzed material on a hydroxyapatite column equilibrated with 10 mM phosphate buffer; and

collecting the fraction having luciferase activity eluted from said hydroxyapatite column by a linear gradient from 10 to 100 mM phosphate buffer, pH=7.5.

5,182,203

BIFUNCTIONAL COMPOUNDS USEFUL IN CATALYZED REPORTER DEPOSITION

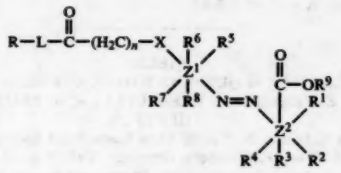
Richard C. Ebersole, Wilmington, Del., and John R. Moran, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 330,357, Mar. 29, 1989, abandoned, and a continuation-in-part of Ser. No. 494,226, Mar. 20, 1990, abandoned. This application Sep. 28, 1990, Ser. No. 589,874

Int. Cl.[5] C12N *9/16, 11/00*; C12Q *1/00*; G01N *33/534*

U.S. Cl. 435—196 **2 Claims**

1. A compound of the formula:



wherein:

R^1 through R^8 are the same or different and are selected from the group consisting of H, OH, OCH_3, straight chain or branched alkyl groups having 1–4 carbon atoms, F, Cl, Br and;

Z^1 and Z^2 are independently phenyl or napthyl;

n is 1–19;

X is N, O, S;

R^9 is selected from the group consisting of glycosides and straight chain or branched alkyl groups having 1–4 carbon atoms;

L is $(NH(CH_2)_sCO)_r$ where s is 1–5 and r is 0–5; and

R is a reporter selected from the group consisting of radioisotopes, fluorogenic, light scattering, chemiluminescent, electrochemical and magnetic materials and enzymes provided that the enzyme does not react with OR^9.

5,182,204

NON-HUMAN CARBONYL HYDROLASE MUTANTS, VECTORS ENCODING SAME AND HOSTS TRANSFORMED WITH SAID VECTORS

David A. Estell, Mountain View; Richard R. Bott, Burlingame; Scott D. Power, San Bruno, and James A. Wells, San Mateo, all of Calif., assignors to Genencor International, Inc.

Continuation of Ser. No. 84,589, Aug. 12, 1987, abandoned, and a continuation-in-part of Ser. No. 94,057, Sep. 3, 1987, abandoned, which is a continuation of Ser. No. 614,617, May 29, 1984, abandoned, and a continuation-in-part of Ser. No. 91,614, Aug. 31, 1987, abandoned, which is a continuation of Ser. No. 614,612, May 29, 1984, Pat. No. 4,760,025, and a continuation-in-part of Ser. No. 41,885, Apr. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 614,615, May 29, 1984, abandoned, and Ser. No. 35,652, Apr. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 858,594, Apr. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 614,612, May 29, 1984, Pat. No. 4,760,025, and Ser. No. 614,617, May 29, 1984, abandoned, and Ser. No. 614,615, May 29, 1984, abandoned, and Ser. No. 614,491, May 29, 1984, abandoned, and Ser. No. 858,594, Apr. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 614,612, May 29, 1984, Pat. No. 4,760,025, and Ser. No. 614,617, May 29, 1984, abandoned, and Ser. No. 614,615, May 29, 1984, abandoned, and Ser. No. 614,491, May 29, 1984, abandoned, and Ser. No. 924,162, Oct. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 614,491, May 29, 1984, abandoned, and Ser. No. 614,612, May 29, 1984, Pat. No. 4,760,025, and Ser. No. 614,617, May 29, 1984, abandoned, and Ser. No. 614,615, May 29, 1984, abandoned, and Ser. No. 614,491, May 29, 1984, abandoned. This application Dec. 11, 1991, Ser. No. 807,786

Int. Cl.[5] C12N *9/56, 9/54, 1/21, 15/55*

U.S. Cl. 435—222 **1 Claim**

1. An essentially pure subtilisin having a different amino acid than that naturally occurring in said subtilisin at the position equivalent to ser+224 in subtilisin naturally produced by *Bacillus amyloliquefaciens*, as shown in FIG. 2, where in different amino acid is one of the twenty naturally occurring L-amino acids wherein the Kcat/Km ratio of the resulting subtilisin is altered by at least 1.5 fold compared to a subtilisin wherein the amino acid residue in said subtilisin equivalent to ser+224 in *Bacillus amyloliquefaciens* is the same as that which is naturally occurring for said subtilisin and wherein the syn-

thetic substrate is selected from the group consisting of AAPF, AAPM, AAAF or FAAF.

5,182,205

NUCLEOTIDE SEQUENCES WHICH ARE SELECTIVELY EXPRESSED IN PRE-B CELLS AND PROBES THEREFOR

Steven R. Bauer, Birsfelden; Akira Kudo, Basel, both of Switzerland; Georg F. Melchers, Grenzach, Fed. Rep. of Germany, and Nobuo Sakaguchi, Saga, Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 119,369, Nov. 10, 1987, abandoned. This application May 8, 1991, Ser. No. 701,328

Claims priority, application United Kingdom, Nov. 27, 1986, 8628433; Jul. 14, 1987, 8716497; Oct. 14, 1987, 8724100

Int. Cl.[5] C12N *5/10, 15/85, 15/12, 1/21*

U.S. Cl. 435—240.2 **15 Claims**

1. A polynucleotide which has the nucleotide sequence

GAGCTCTGCATGTCTGCACCATGTCCTGGGCT
CCTGTCCTGCTCATGCACTTTGTCTACT
GCACAGGTGAGGGAACCCCCAGATCCCAAAGA
CTCCTGCCCCTTCCTTCATCCTGCCCTG
CCCCCACGGGCCACATGCATCTGTGTCACCAG
GTTGTGGTCCTCAGCCGGTGCTACATCA
GCCGCCGGCCATGTCCTCGGCCCTTGGAACCA
CAATCCGCCTCACCTGCACCCTGAGGAA
CGACCATGACATCGGTGTGTACAGCGTCTACT
GGTACCAGCAGAGGCCGGGCCACCCTCC
CAGGTTCCTGCTGAGATATTTCTCACAATCAG
ACAAGAGCCAGGGCCCCCAGGTCCCCCC
TCGCTTCTCTGGATCCAAAGATGTGGCCAGGA
ACAGGGGGTATTTGAGCATCTCTGAGCT
GCAGCCTGAGGACGAGGCTATGTATTACTGTG
CTATGGGGGCCCGCAGCTCGGAGAAGGA
GGAGAGGGAGAGGGAGTGGGAGGAAGAAATGG
AACCCACTGCAG.

or a homologous or degenerate sequence thereof, or fragments of said polynucleotide, which fragments hybridize to nucleic acid sequences expressed in pre-B cells and not expressed in other types of cells.

5,182,206

PYRIMINE-PRODUCING BACTERIA

Masanori Yamamoto, Kaizuka; Toshio Nakayama, Nara; Osamu Fujii, Nishinomiya, and Rie Okabe, Osaka, all of Japan, assignors to House Food Industrial Co., Ltd., Higashi-Osaka, Japan

Division of Ser. No. 544,258, Jun. 26, 1990, Pat. No. 5,108,924. This application Dec. 10, 1991, Ser. No. 804,586

Claims priority, application Japan, Jun. 27, 1989, 1-164774; Jun. 27, 1989, 1-164775; Jun. 27, 1989, 1-164776; Jun. 27, 1989, 1-164777

Int. Cl.[5] C12P *13/00, 13/04, 17/10;* **C12R** *1/38*

U.S. Cl. 435—253.3 **2 Claims**

1. A bacteriologically pure culture of a pyrimine-producing strain belonging to genus Pseudomonas exhibiting the following bacteriological properties:

Dentrification reaction: negative

Assimilation of carbon sources:

D-arabinose: positive

L-lysine: negative

wherein it produces pyrimine in an amount of not less then 400 μg/ml when it is cultured in the presence of a plant in an LS basal medium and it starts production of pyrimine at latest 8 days after the initiation of the culture.

5,182,207

STRAINS OF *STREPTOMYCES THERMOARCHAENSIS*

John B. Ward, Busbey; Hazel M. Noble, Burnham; Neil Porter, Pinner; Richard A. Fletton, Ruislip, and David Noble, Burnham, all of England, assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 29,796, Mar. 25, 1987, abandoned, which is a division of Ser. No. 775,737, Sep. 12, 1985, abandoned. This application Feb. 14, 1990, Ser. No. 480,373

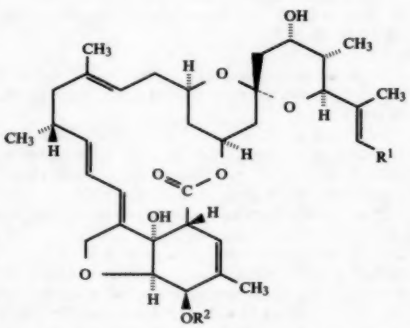
Claims priority, application United Kingdom, Sep. 14, 1984, 842378; Dec. 21, 1984, 8432519

Int. Cl.[5] C12N *1/20;* **C12P** *17/18, 1/04*

U.S. Cl. 435—253.5 **3 Claims**

1. A biologically pure culture of *Streptomyces thermoarchaensis* selected from the strains consisting of NCIB 12015, NCIB 12111, NCIB 12112, NCIB 12113, NCIB 12114 and mutants thereof capable of producing a product in recoverable amounts; said product having the formula:

(III)



in which R^1 is a methyl, ethyl or isopropyl group and R^2 is hydrogen or a methyl group.

5,182,208

PROCESSES FOR IN VIVO PRODUCTION OF ASTAXANTHIN AND PHAFFIA RHODOZYMA YEAST OF ENHANCED ASTAXANTHIN CONTENT

Eric A. Johnson, Madison, Wis.; David Schreiber, Columbia, Md.; Kwok P. Ho, Columbia; William T. Hall, Rockville, Md.; Huei-hsiung Yang, Rockville, Md., and Beril Geldiay-Tuncer, College Park, Md., assignors to Igene Biotechnology, Inc., Columbia, Md.

Continuation of Ser. No. 385,961, Jul. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 229,536, Aug. 8, 1988, abandoned. This application Aug. 23, 1989, Ser. No. 399,183

Int. Cl.[5] C12R *1/645;* **C12P** *1/02;* **C12N** *1/14*

U.S. Cl. 435—254 **21 Claims**

1. A process for the production of a yeast having a enhanced astaxanthin content, comprising culturing a microorganism of genus Phaffia in a nutrient medium containing at least one of (i) an antibiotic selected from the group consisting of antimycin, tunicamycin, and nystatin, and (ii) mevalonic acid lactone.

5,182,209

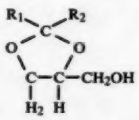
ENANTIOSELECTIVE PREPARATION OF S-2R_1,2R_2-1,3-DIOXOLANE-4-METHANOL AND DERIVATIVES THEREOF

Arie Geerlof, Alphen a/d Rijn; Barend Groen, 's-Gravenhage, and Johannis A. Duine, Schiedam, all of Netherlands, assignors to DSM N.V., Netherlands

Filed Jun. 22, 1990, Ser. No. 541,910
Claims priority, application Netherlands, Aug. 9, 1989, 8902035
Int. Cl.[5] C12P *41/00*
U.S. Cl. 435—280 8 Claims

1. Process for the enantioselective conversion of an enantiomer mixture of 2R_1, 2R_2-1,3-dioxolane-4-methanol comprising the following steps:

combining the enantioselective enzyme, PQQ-dependent alcohol dehydrogenase with an enantiomer mixture of 2R_1, 2R_2-1,3-dioxolane-4-methanol of the formula:



where R_1 and R_2 independently are selected from the group consisting of hydrogen, an optionally branched alkyl group, an aryl, and R_1 and R_2 with the carbon atom to which they are attached being an optionally substituted carbocyclic ring, said combination of ingredients producing 2R_1, 2R_2-3-dioxolane-4-methanol enriched in S-2R_1, 2R_2-1,3-dioxolane-4-methanol.

5,182,210

FOWLPOX VIRUS PROMOTERS

Matthew M. Binns, Huntingdon; Michael E. G. Boursnell, Huntingdon; Joan I. A. Campbell, Huntington, and Fiona M. Tomley, Cambridge, all of England, assignors to National Research Development Corporation, London, United Kingdom

PCT No. PCT/GB88/00922, § 371 Date Apr. 17, 1990, § 102(e) Date Apr. 17, 1990, PCT Pub. No. WO89/03879, PCT Pub. Date May 5, 1989
PCT Filed Oct. 21, 1988, Ser. No. 469,608
Claims priority, application United Kingdom, Oct. 23, 1987, 8724885
Int. Cl.[5] C12N *15/63, 15/86, 15/11*
U.S. Cl. 435—320.1 8 Claims

1. An isolated DNA consisting essentially of the promoter sequence which is located immediately 5' to an open reading frame in the fowlpox virus genome, said open reading frame being selected from the group consisting of:

(1) The FB4b gene which is fowlpox virus encodes a protein of about 657 amino acids in a sequence beginning

Met Glu Ser Asp Ser Asn Ile Ala Ile Glu

Glu Val Lys Tyr Pro Asn Ile Leu Leu Glu,

(2) The BamHI fragment ORF8 gene encoding a protein of about 116 amino acids in a sequence beginning

Met Glu Glu Gly Lys Pro Arg Arg Ser Ser

Ala Val Leu Trp Met Leu Ile Pro Cys Gly,

(3) The BamHI fragment ORF5 gene encoding a protein of about 105 amino acids in a sequence beginning

Met Ile Ile Arg Arg Asn Asn Lys Ala Leu

-continued

Gly Ser Val Met Ser Asp Phe Ile Lys Thr, and

(4) The BamHI fragment ORF10 gene encoding a protein of about 280 amino acids in a sequence beginning

Met Lys Phe Lys Glu Val Arg Asn Thr Ile

Lys Lys Met Asn Ile Thr Asp Ile Lys Ile.

5,182,211

PLASMID VECTORS ENCODING A PROTEIN OF A PICORNAVIRUS

Marc Girard, Paris; Czeslaw Wychowski, Meurchin, and Annette Martin, Paris, all of France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 229,709, Aug. 8, 1988, abandoned. This application Sep. 20, 1991, Ser. No. 762,269
Claims priority, application France, Aug. 7, 1987, 87 11337
Int. Cl.[5] C12N *15/85*
U.S. Cl. 435—320.1 3 Claims

1. Plasmid pAM4.

3. Plasmid pAM420.

5,182,212

TIME TEMPERATURE INDICATOR WITH DISTINCT END POINT

Thomas J. Jalinski, Waunakee, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Division of Ser. No. 648,712, Jan. 31, 1991, Pat. No. 5,085,802. This application Oct. 18, 1991, Ser. No. 780,672
Int. Cl.[5] G01N *31/00*
U.S. Cl. 436—2 6 Claims

1. A method for making an indicator for indicating time-temperature histories in conjunction with the storage of sensitive products and compositions, comprising admixing a first specific reaction pair for generating acid, a second specific reaction pair for generating base and at least one pH sensitive dye to form an aqueous solution, said first specific reaction pair having a first substrate present in a stoichiometric excess amount over the amount of a specific substrate provide in said second specific reaction pair.

5,182,213

METHOD FOR DETECTING THE PRESENCE OF PEROXIDATIVELY ACTIVE SUBSTANCE IN BASIC MEDIA

Marvin A. Genshaw, Elkhart, and Michael J. Pugia, Granger, both of Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Mar. 18, 1991, Ser. No. 670,730
Int. Cl.[5] G01N *33/72*
U.S. Cl. 436—66 7 Claims

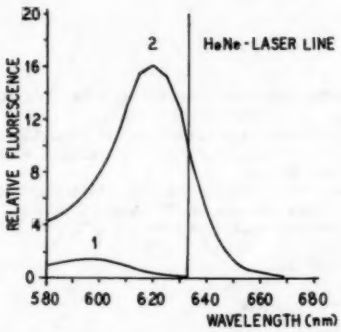
1. An assay for the detection of a peroxidatively active substance in an aqueous test sample which comprises providing an aqueous medium having a pH of 10 to 14 suspected of containing the peroxidatively active substance to be detected and adding to such medium a peroxide together with a phenylenediamine and a naphthol which, under the conditions of the assay, couple to form a chromogen thereby providing a detectable color change in the medium in the presence of the peroxidatively active substance.

5,182,214

METHOD FOR DETECTION AND DETERMINATION OF HUMAN SERUM ALBUMIN

Manfred Kessler, Lorenz-Vest-Weg 11, 8041 Graz, and Otto S. Wolfbeis, Im Hoffeld 32, 8046 Graz, both of Austria

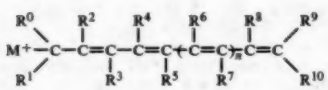
Filed Jul. 20, 1990, Ser. No. 556,268
Claims priority, application Austria, Aug. 17, 1989, 1949/89
Int. Cl.[5] G01N *33/52*
U.S. Cl. 436—88 6 Claims



1. A method for optical detection and quantitative determination of human serum albumin or HSA in biological liquids comprising the steps of

a) providing a sample of a biological liquid containing human serum albumin or HSA;

b) adding to the sample an anionic cyanine dye of general formula (1)



(I)

where

n means 0 or 1;

M^+ is any monovalent cation;

R^0 is cyano, aryl, or COR where R stands for alkoxy, alkyl or aryl;

R^1 is cyano, aryl, or COR where R stands for alkoxy, alkyl, or aryl;

R^2, R^8 each stand for hydrogen, alkyl, or cyano;

R^3, R^5, R^6, R^7 each stand for hydrogen or alkyl;

R^4 stands for hydrogen, halogen, alkyl, aryl, aryloxy, alkoxy, or NR_2 where R stands for alkyl or aryl;

R^9 stands for cyano, aryl, COR where R stands for alkoxy, alkyl, or aryl, CO-NAB where A stands for alkyl, aryl, or carbamoyl and B stands for alkyl or aryl, hydrogen, or heterocyclyl;

R^{10} stands for cyano, aryl, COR where R stands for alkoxy, alkyl, or aryl, CO-NAB where A stands for alkyl, aryl or carbamoyl, and B stands for alkyl or aryl, hydrogen, or heterocyclyl;

and where at least one substituent of R^0, R^1, R^9 or R^{10} stands for cyano;

c) measuring the increase in fluorescence intensity, or the change in fluorescence polarization, or the change in fluorescence lifetime of the dye, or the change in absorption of the dye as a result of binding of HSA to the dye; and

d) relating the change in fluorescence or absorption to the actual amount of HSA in the sample.

5,182,215

SCREENING TEST FOR PINEOCYTOMA

David C. Klein, Gaithersburg, Md.; Horst W. Korf, Pohlheim, Fed. Rep. of Germany, and Jeffrey N. Bruce, Hackensack, N.J., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Jun. 19, 1989, Ser. No. 368,270
Int. Cl.[5] G01N *33/558*
U.S. Cl. 436—514 2 Claims

1. A screening test for pineocytoma, comprising the steps of:

a) obtaining cerebrospinal fluid from an individual;

b) contacting said fluid with an antibody which specifically binds S-antigen, under conditions effective for and a time sufficient for binding of said antibody to said S-antigen to occur;

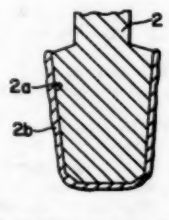
c) detecting any S-antigen from said fluid bound to said antibody, the presence of S-antigen in said fluid being indicative of pineocytoma in the individual from whom said cerebrospinal fluid was obtained.

5,182,216

ASSAYS AND DEVICES THEREFOR

Richard A. Clayton, Rushden, and Philip Porter, Bedford, both of England, assignors to Unilever Patent Holdings B.V., Netherlands

PCT No. PCT/GB88/00036, § 371 Date Nov. 22, 1988, § 102(e) Date Nov. 22, 1988, PCT Pub. No. WO88/05539, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 20, 1988, Ser. No. 250,629
Claims priority, application United Kingdom, Jan. 22, 1987, 8701432
Int. Cl.[5] G01N *33/543, 33/549*
U.S. Cl. 436—518 9 Claims

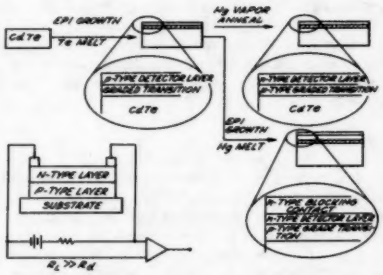


1. In a specific binding assay for an analyte in a liquid sample involving the steps of simultaneously incubating the liquid sample with a first specific antibody binding reagent immobilised on a solid phase carrier surface and with a second specific antibody binding reagent dissolved or dispersed in the liquid sample and which bears a label by means of which the result of the assay can be determined, permitting a sandwich reaction to occur during incubation between the antibody binding reagents and the analyte and then detecting the amount of reaction which has occurred, the improvement which involves using, as the second binding reagent, an antibody which is contained within a layer of solid material which is applied as a coating superimposed over the solid carrier surface on which the first specific antibody binding reagent is immobilised, the solid material being readily soluble or dispersible in the liquid sample so that as said solid material dissolves or disperses in the liquid sample, the labelled reagent is released at the same time as the immobilized reagent is exposed to the sample thereby avoiding a spuriously low assay result or hook effect occurring if the analyte is present at high concentration in the sample.

5,182,217
METHOD OF FABRICATING A TRAPPING-MODE

Paul R. Norton, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Division of Ser. No. 545,108, Jun. 27, 1990, Pat. No. 5,079,610, which is a continuation of Ser. No. 804,719, Dec. 5, 1985, abandoned. This application Aug. 2, 1991, Ser. No. 740,570
The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.
Int. Cl.[5] H01L *31/18*
U.S. Cl. 437—5 20 Claims

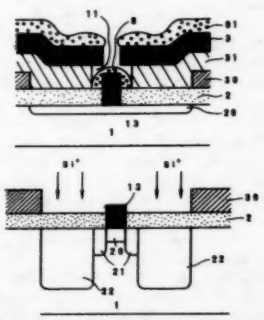


1. A method for making a photoconductive photodetector comprising epitaxially growing a body of semiconductor material on an electrically insulating substrate; annealing the resulting body of semiconductor material attached to said substrate for a time sufficient to form a region of first conductivity type substantially completely overlying a region of second conductivity type within said body of semiconductor material, and said photodetector having a detectivity of at least about $2\times10^{17}\lambda\eta/(Q_B)^{\frac{1}{2}}$cmHz$^{\frac{1}{2}}$/Watt where the radiation incident on said photodetector is in the range of about 1 to about 25 microns or more, and where λ is the wavelength of radiation incident on said photodetector, Q_B is the background photon flux, and η is the quantum efficiency.

5,182,218
PRODUCTION METHODS FOR COMPOUND SEMICONDUCTOR DEVICE HAVING LIGHTLY DOPED DRAIN STRUCTURE

Mitsuaki Fujihira, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Filed Feb. 20, 1992, Ser. No. 837,891
Claims priority, application Japan, Feb. 25, 1991, 3-029967; May 17, 1991, 3-113116
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—22 14 Claims

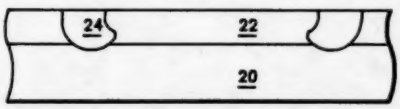


8. A method of making a compound semiconductor device having a field effect transistor structure comprising:
a first step of forming a channel layer in a semiconductor substrate with using a first resist pattern having an opening in a position corresponding an element forming area, thereafter depositing gate electrode material on the substrate, and forming a second resist pattern having an opening in a position corresponding to a gate electrode forming area on said gate electrode material deposited on the substrate;
a second step of depositing a first insulating material to form a first gate pattern on said gate electrode forming area, and removing said second resist pattern in an area over said gate electrode forming area by etching;
a third step of depositing a insulating material on the substrate to form a second gate pattern covering said first gate pattern, and thereafter removing all of said resist pattern;
a fourth step of selectively removing said gate electrode material with using said second gate pattern as a mask, and performing ion implantation on the substrate to form heavily doped layer;
a fifth step of removing said second gate pattern and removing said gate electrode material exposed by removing said second gate pattern with using said first gate pattern as a mask to form a gate portion; and
a sixth step of performing ion implantation with using said gate portion and said first gate pattern as a mask to form a lightly doped layer.

5,182,219
PUSH-BACK JUNCTION ISOLATION SEMICONDUCTOR STRUCTURE AND METHOD

Carl Nelson, San Jose, and Jia-Tarng Wang, Cupertino, both of Calif., assignors to Linear Technology Corporation, Milpitas, Calif.

Continuation of Ser. No. 554,299, Jul. 17, 1990, abandoned, which is a division of Ser. No. 384,160, Jul. 29, 1989, abandoned.
This application Aug. 1, 1991, Ser. No. 739,791
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—27 10 Claims



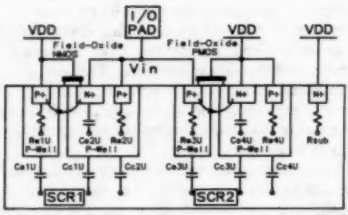
1. In the manufacture of an integrated circuit in a silicon semiconductor, a method of forming a junction isolated tub region, comprising the steps of:
(a) providing a silicon substrate of a first conductivity type,
(b) forming an epitaxial layer including a second conductivity type impurity to form a layer of opposite conductivity type on a surface of said substrate,
(c) forming a closed isolation region by introducing an impurity of said first conductivity type through said epitaxial layer and into said substrate in a manner in which the first conductivity type impurity concentration in said isolation region decreases with distance toward the inside of said isolation region, said isolation region surrounding a region of said epitaxial layer, thereby forming an electrical junction enclosing said isolated tub region therein, and
(d) introducing implanting or diffusing a second conductivity type impurity into the surface of said isolated tub region for increasing the second conductivity type impurity concentration of a surface area of said isolated tub region, thereby pushing back said electrical junction and enlarging the surface area of said isolated tub region of said epitaxial layer.

5,182,220

CMOS ON-CHIP ESD PROTECTION CIRCUIT AND SEMICONDUCTOR STRUCTURE

Ming-Dou Ker; Chung-Yuan Lee, and Chung-Yu Wu, all of Hsinchu, Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Apr. 2, 1992, Ser. No. 863,693
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—34 **14 Claims**



1. Method of simultaneously fabricating an on-chip silicon controlled rectifier protection circuit against electrostatic discharge pulses for highly dense CMOS integrated circuits as the CMOS integrated circuits are formed comprising:

providing an area in an N type monocrystalline silicon substrate of said integrated circuit designated for said protection circuit;

forming P type wells in said designated area wherein at least one pair of P type wells are closely positioned;

forming a P+ anode region in one of said at least one pair of P type wells;

forming an N+ cathode region and a P+ region within the other of said at least one pair of P type wells, whereby a silicon controlled rectifier device is formed; forming a gate dielectric and electrode on the surface of said monocrystalline silicon and closely associated with said at least one pair of P type wells, whereby a field oxide MOS device is formed; and

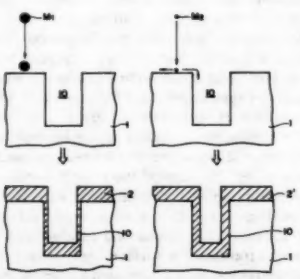
forming electrical connections to form said protection circuit to supply voltage, ground, input/output signal source and said highly dense CMOS circuit.

5,182,221

METHOD OF FILLING A RECESS FLAT WITH A MATERIAL BY A BIAS ECR-CVD PROCESS

Junichi Sato, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 12, 1991, Ser. No. 714,235
Claims priority, application Japan, Jun. 13, 1990, 2-154232
Int. Cl.[5] H01L *21/76*
U.S. Cl. 437—67 **4 Claims**



1. A method of filling a recess so that it is flat with silicon dioxide by a bias ECR-CVD process, characterized in controlling the bias ECR-CVD process so as to meet a condition expressed by:

$$R=2y/x$$

where R is the ratio of the vertical deposition rate at which the silicon dioxide is deposited on the vertical side surface of the recess to a horizontal deposition rate at which the silicon dioxide is deposited on the horizontal bottom surface of the recess, x is the width of the recess and y is the depth of the recess, and filling said recess so that it is flat with silicon dioxide by a bias ECR-CVD process, characterized in that a source gas containing a silicon-containing organic gas selected from TEOS, DADBS, TMCTS and DES is used.

2. A method of filling a recess so that it is flat with silicon dioxide by a bias ECR-CVD process, characterized in controlling the bias ECR-CVD process so as to meet a condition expressed by:

$$R=2y/x$$

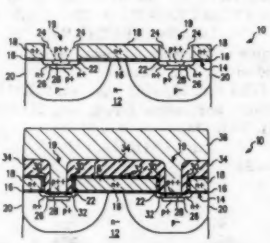
where R is the ratio of the vertical deposition rate at which the silicon dioxide is deposited on the vertical side surface of the recess to a horizontal deposition rate at which the silicon dioxide is deposited on the horizontal bottom surface of the recess, x is the width of the recess and y is the depth of the recess, and filling said recess so that it is flat with a material by a bias ECR-CVD process, characterized in that a deposition cycle using a source gas containing a silicon-containing source gas and a deposition cycle using a source gas containing a silicon hydride are performed alternately.

5,182,222

PROCESS FOR MANUFACTURING A DMOS TRANSISTOR

Satwinder Malhi, Garland, and Taylor R. Efland, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 26, 1991, Ser. No. 720,570
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—41 **11 Claims**



9. A method for making a semiconductor device at a face of a semiconductor layer, comprising the steps of:

forming a gate over said semiconductor layer, said gate defining a through-opening to said semiconductor layer;

forming a first region of a first conductivity type substantially self-aligned with said through-opening;

after forming said gate, and prior to said step of forming said first region, implanting a deep well into said semiconductor layer through said through-opening;

forming a sacrificial sidewall in said through-opening subsequent to forming said first region;

forming a second region of a second conductivity type different than said first conductivity type substantially self-aligned with said sacrificial sidewall subsequent to forming said sacrificial sidewall;

prior to forming said second region of said second conductivity type, forming a third region of said second conduc-

tivity type below said first region substantially self-aligned with said sacrificial sidewall;

removing said sacrificial sidewall; and

forming a high conductivity surface region in contact with both said first and second regions of said first and second conductivity type.

5,182,223

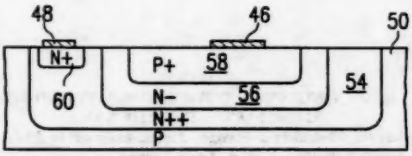
METHOD OF MAKING AN INTEGRATED CIRCUIT WITH CAPACITOR

Kevin M. Ovens, Plano, and Jeffrey A. Niehaus, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 12, 1990, Ser. No. 629,922

Int. Cl.[5] H01L *21/70*

U.S. Cl. 437—60 5 Claims



1. A method of fabricating an integrated circuit comprising the steps of:

forming a layer of semiconductor;

fabrication functional circuitry in the semiconductor layer such that the functional area occupies only a first portion of the semiconductor layer of the semiconductor layer; and

forming a capacitor in a second remaining portion of the semiconductor layer not used to form the functional circuitry, to provide a capacitor across the area of the semiconductor layer not utilized by the functional circuitry.

5,182,224

METHOD OF MAKING DYNAMIC RANDOM ACCESS MEMORY CELL HAVING A SDHT STRUCTURE

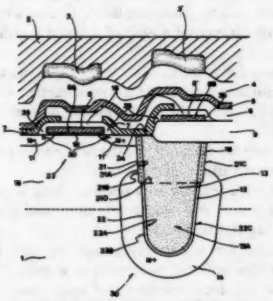
Jae W. Kim, Seoul, and In S. Chung, Ichon-Uep, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Division of Ser. No. 407,886, Sep. 15, 1989, abandoned. This application Jan. 16, 1991, Ser. No. 641,621

Claims priority, application Rep. of Korea, Sep. 22, 1988, 12241/88

Int. Cl.[5] H01L *21/70*

U.S. Cl. 437—52 3 Claims



1. A method for manufacturing a DRAM cell having a SDHT structure comprising the steps of:

forming a P well region on a P type silicon substrate:

forming a first trench from the top of the P well region into a portion of the P well region with the first trench having a sidewall surface, and a bottom surface;

depositing a CVD oxide film layer on the sidewall surface and on the bottom surface of the first trench;

depositing a nitride layer on the CVD oxide film layer formed in the first trench;

removing a portion of the nitride layer and CVD oxide film layer from the bottom surface of the first trench to expose the P well region;

forming a second trench from the exposed portion of the P well region into the P type silicon substrate with the second trench having a sidewall surface, and a bottom surface;

depositing an impurity dopant source on the nitride layer deposited on the CVD oxide film layer formed on the sidewall surface, of the first trench, and on the sidewall surface and bottom surface of the second trench;

heating the impurity dopant source to form a N+ diffusion region from the sidewall surface and bottom surface of the second trench into a portion of the P well region and into a portion of the P type silicon substrate;

removing the impurity dopant source from the first and second trench;

removing the nitride layer formed on the CVD oxide film layer on the sidewall surface of the first trench;

forming a capacitor dielectric layer on the CVD oxide film layer and on the sidewall surface of the second trench; and

filling the first and second trench with a conducting material for inside charge storage electrode, and planarizing the resulting top surface, thereby forming the inside charge storage electrode.

5,182,225

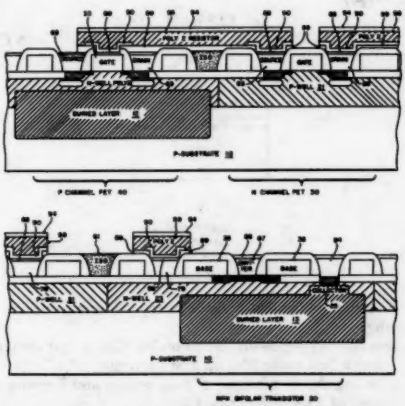
PROCESS FOR FABRICATING BICMOS WITH HYPERSHALLOW JUNCTIONS

James A. Matthews, Milpitas, Calif., assignor to MicroUnity Systems Engineering, Inc., Sunnyvale, Calif.

Division of Ser. No. 463,290, Jan. 10, 1990. This application Jan. 28, 1991, Ser. No. 647,717

Int. Cl.[5] H01L *21/328, 21/335*

U.S. Cl. 437—58 7 Claims



1. A process for fabricating n-channel field-effect devices (NFETs), p-channel field-effect devices (PFETs) and bipolar junction transistors (BJTs) in a silicon substrate, said NFETs, PFETs and BJTs having very shallow junction depths, said process comprising the steps of:

(a) depositing a first layer of polysilicon over said substrate;

(b) selectively etching said first polysilicon layer to form a plurality of first polysilicon members separated by a corresponding plurality of substantially equal spaces, a first portion of said first polysilicon members forming the gates of said NFETs and PFETs, a second portion forming the extrinsic base contacts of said BJTs, and a third portion functioning as dummy members for maintaining the spacing between said first polysilicon members;

(c) insulating said first polysilicon members;

(d) depositing an additional layer of polysilicon to uniformly fill said spaces;

(e) etching said additional polysilicon layer until the upper surface of said additional polysilicon layer is substantially coplanar with said first polysilicon members, thereby creating a plurality of second polysilicon members within said spaces each of which are electrically isolated from said first polysilicon members, a first portion of second polysilicon members forming the source/drain contacts of said NFETs, a second portion forming the source/drain contacts of said PFETs, and a third portion forming the emitter contacts of said BJTs;

(f) implanting said first portion of said second polysilicon members with a first dopant having a conductivity type opposite to that of said substrate;

(g) implanting said second portion of said first polysilicon members and said second portion of said second polysilicon members with a second dopant having a conductivity type the same as that of said substrate;

(h) implanting said third portion of said second polysilicon members with a third dopant having a conductivity type opposite to that of said substrate;

(i) annealing said substrate to diffuse said first, second, and third dopants from said first and second polysilicon layers into said substrate, therein forming the source/drain regions of said NFETs and PFETs, and the extrinsic base and emitter regions of said BJTs.

5,182,226

METHOD FOR FABRICATION OF A FIELD OXIDE OF THE BURIED INVERSE T-TYPE USING OXYGEN OR NITROGEN ION IMPLANTATION

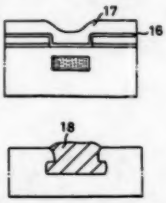
Seong J. Jang, Seoul, Rep. of Korea, assignor to Gold Star Electron Co., Ltd., Rep. of Korea

Filed Mar. 23, 1992, Ser. No. 856,020

Claims priority, application Rep. of Korea, Apr. 15, 1991, 6019/1991

Int. Cl.[5] H01L *21/76*

U.S. Cl. 437—70 **5 Claims**



1. A method for fabrication of a semiconductor device comprising:

successively depositing a pad nitride film, a first nitride film and a first oxide film on a Si substrate;

exposing the Si substrate of field region and forming a side wall of a second nitride film;

implanting ion impurities into the exposed substrate to a first depth, using a first ion implantation operation with a first energy range;

removing the first oxide film and the second nitride film and successively depositing a second oxide film and a third nitride film on a whole surface;

etching the third nitride film to expose a fixed portion of the Si substrate;

implanting ion impurities into said fixed portion of the substrate to a second depth, using a second ion implantation operation with a second energy range lower than the first ion impurity implantation operation;

forming a field oxide by heat treatment of the impurities implanted within said substrate;

removing the remaining third nitride film, second nitride film, first nitride film and pad nitride film; and

forming a transistor in an active region isolated by the field oxide.

5,182,227

SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

Takayuki Matsukawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

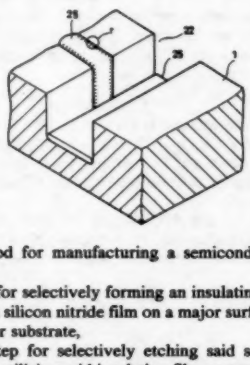
Division of Ser. No. 344,511, Apr. 20, 1989, abandoned, which is a continuation of Ser. No. 41,672, Apr. 23, 1987, abandoned.

This application Sep. 28, 1990, Ser. No. 590,189

Claims priority, application Japan, Apr. 25, 1986, 61-97218; May 14, 1986, 61-112017

Int. Cl.[5] H01L *21/76*

U.S. Cl. 437—72 **4 Claims**



1. A method for manufacturing a semiconductor device, comprising:

a first step for selectively forming an insulating film including a first silicon nitride film on a major surface of a semiconductor substrate,

a second step for selectively etching said semiconductor substrate utilizing said insulating film as a mask and forming a trench having a wall of a given width and a bottom surface,

a third step for forming a second silicon nitride film on the entire surface including the major surface of said semiconductor substrate, the wall, and the bottom surface of said trench,

a fourth step for forming a resist film on the entire surface of said second silicon nitride film,

a fifth step for leaving said resist on only a part of the wall of said trench of a width less than said given width and removing the remainder,

a sixth step for selectively removing said second silicon nitride film utilizing said resist as a mask,

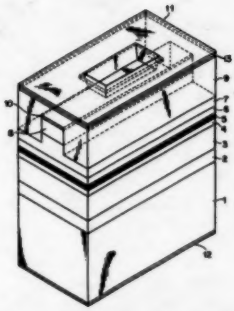
a seventh step for removing said resist, and

an eighth step for forming a local field isolation region by a selective oxidation process utilizing said first and second silicon nitride films as left.

5,182,228
METHOD OF MANUFACTURING A SEMICONDUCTOR LIGHT-EMITTING DEVICE

Hiroshi Sekii, Ibaraki, and Koichi Imanaka, Kyoto, both of Japan, assignors to Omron Corporation, Kyoto, Japan

Division of Ser. No. 539,698, Jun. 18, 1990, Pat. No. 5,084,893.
This application Jan. 28, 1992, Ser. No. 827,782
Claims priority, application Japan, Jun. 29, 1989, 1-165344
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—129 15 Claims

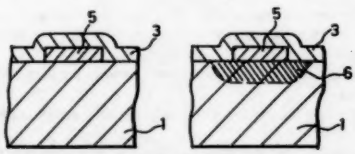


1. A method of manufacturing a semiconductor light-emitting device, comprising the steps of:
forming a ridge on a semiconductor wafer;
forming a buried layer consisting of a high-resistance semiconductor material around and on said ridge so as to bury said ridge;
removing said buried layer at a location overlaying said ridge until a top surface of said ridge is exposed; and
forming an electrode on an entirety of said exposed top surface of said ridge and a top surface of said buried layer surrounding said ridge.

5,182,229
METHOD FOR DIFFUSING AN N TYPE IMPURITY FROM A SOLID PHASE SOURCE INTO A III-V COMPOUND SEMICONDUCTOR

Satoshi Arimoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1991, Ser. No. 798,740
Claims priority, application Japan, Nov. 28, 1990, 2-335830
Int. Cl.[5] H01L *21/225*
U.S. Cl. 437—162 16 Claims

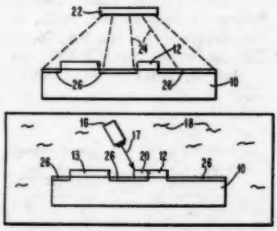


1. A method for diffusing an n type impurity into a III-V compound semiconductor comprising:
depositing a film consisting of amorphous or polycrystalline selenium directly on and in contact with a III-V compound semiconductor;
depositing a protection film selected from the group consisting of SiO_2 and silicon nitride directly on said amorphous or polycrystalline film of selenium; and
diffusing selenium from said amorphous or polycrystalline film into said III-V compound semiconductor by annealing.

5,182,230
LASER METHODS FOR CIRCUIT REPAIR ON INTEGRATED CIRCUITS AND SUBSTRATES

John J. Donelon, Mahopac; James P. Doyle, Bronx, both of N.Y.; Jerry E. Hurst, Jr., San Jose, Calif.; Modest M. Oprysko, Mahopac, N.Y.; Stephen M. Rossnagel, White Plains, N.Y., and Robert J. von Gutfeld, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,487
Int. Cl.[5] H01L *21/26, 21/465;* C01B *31/00*
U.S. Cl. 437—173 43 Claims

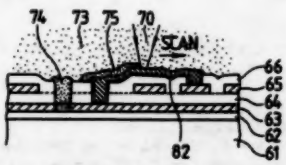


1. A method of forming an electrically conductive film layer in the surface of a substrate, comprising the steps of:
a) irradiating the substrate surface with an ion beam for a first period of time sufficient to form a carbonaceous surface region thereon;
b) allowing said substrate to cool for a second period of time;
c) repeating steps a) and b) until the sheet resistance of said carbonaceous surface region reaches a predetermined value; and
d) irradiating the substrate surface with a second ion beam to selectively strip a portion of the carbonaceous surface region from the substrate.

5,182,231
METHOD FOR MODIFYING WIRING OF SEMICONDUCTOR DEVICE

Mikio Hongo; Katsuro Mizukoshi; Shyuzo Sano; Takashi Kamimura, all of Yokohama, and Takahiko Takahashi, Iruma, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 334,145, Apr. 6, 1989, Pat. No. 5,026,664. This application May 23, 1990, Ser. No. 528,064
Claims priority, application Japan, May 29, 1989, 1-132601
The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.
Int. Cl.[5] H01L *21/26*
U.S. Cl. 437—173 19 Claims



1. A method for modifying wiring of a semiconductor device having a multilayer interconnection on a semiconductor substrate, including the steps of:
forming a plurality of fine holes through an insulating film by irradiation with a converged energy beam to selected internal lines in the semiconductor device to expose said selected internal lines;
sputtering a thin buffer film less than 1000 Å thick on an upper surface of the insulating film and in said fine holes;
forming an additional connection line along a narrow prese-

lected path on said buffer film by energy beam CVD of at lest one of molybdenum, tungsten, and aluminum to interconnect said selected internal lines;

annealing said additional connection line by radiating an energy beam thereon to reduce the resistance of the additional connection line; and

forming an insulating film at least on said additional connection line by energy beam CVD to cover the additional connection line with said insulating film.

5,182,232

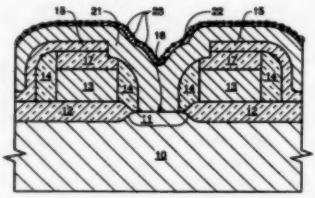
METAL SILICIDE TEXTURIZING TECHNIQUE

Navjot Chhabra, and Gurtej S. Sandhu, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 681,796, Apr. 8, 1991, abandoned. This application Nov. 15, 1991, Ser. No. 793,031

Int. Cl.[5] H01L *21/44, 21/465*

U.S. Cl. 437—200 **29 Claims**



1. A process for texturizing a conductive structure fabricated on a silicon wafer, comprising the following steps:

a) depositing a layer of polycrystalline silicon, said polycrystalline silicon conforming to existing topography of said silicon wafer;

b) depositing a metal silicide superjacent said polycrystalline silicon layer;

c) annealing said metal silicide thereby forming silicide grain size being approximately 1/10 the size of the conductive structure and silicon rich grain boundaries in said metal silicide film;

d) oxidizing said metal silicide film thereby consuming silicon atoms int eh grain boundaries of said metal silicide film; and

e) etching said oxide from top of said metal silicide thereby creating said texturized surface of said conductive structure;

wherein said oxidizing step and said etching step are performed separately in order to first isolate said silicon atoms in the grain boundaries by said oxidizing step and then consume said oxidized silicon int he grain boundaries by said etching step.

5,182,233

COMPOUND SEMICONDUCTOR PELLET, AND METHOD FOR DICING COMPOUND SEMICONDUCTOR WAFER

Kazuhiko Inoue, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 557,782, Jul. 26, 1990, abandoned. This application Oct. 7, 1991, Ser. No. 771,850

Claims priority, application Japan, Aug. 2, 1989, 1-200773

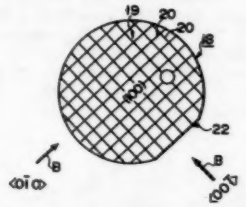
Int. Cl.[5] H01L *21/302*

U.S. Cl. 437—226 **2 Claims**

1. A method for dicing a compound semiconductor wafer, comprising the steps of:

a) providing a single-crystal III-V compound semiconductor wafer having first dicing lines positioned a distance apart in a [001] direction, second dicing lines positioned a distance apart in a [010] direction, and an orientation flat with a {100} exposed surface;

b) dicing said semiconductor wafer along said first dicing lines in the [001] direction by use of a blade dicer; and



c) dicing said compound semiconductor wafer along said second dicing lines in the [010] direction by use of a blade dicer.

5,182,234

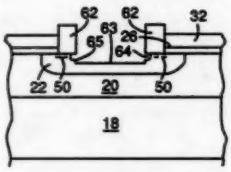
PROFILE TAILORED TRENCH ETCH USING A SF_6-O_2 ETCHING COMPOSITION WHEREIN BOTH ISOTROPIC AND ANISOTROPIC ETCHING IS ACHIEVED BY VARYING THE AMOUNT OF OXYGEN

Theodore O. Meyer, Bend, Oreg., assignor to Advanced Power Technology, Inc., Bend, Oreg.

Continuation of Ser. No. 467,636, Jan. 19, 1990, abandoned, which is a division of Ser. No. 194,874, May 17, 1988, Pat. No. 4,895,810, which is a continuation-in-part of Ser. No. 842,771, Mar. 21, 1986, Pat. No. 4,748,103. This application Jul. 26, 1991, Ser. No. 737,560

Int. Cl.[5] H01L *21/00, 21/02, 21/306, 21/308*

U.S. Cl. 437—233 **23 Claims**



1. A method for profile tailoring sidewalls of a trench in forming a semiconductor device on a silicon substrate, comprising:

forming an insulative layer on an upper surface of the substrate;

patterning the insulative layer to define an outline characteristic;

forming an opening in the insulative layer wherein the upper surface of the silicon is exposed within an area of the defined outline characteristic;

plasma etching the exposed silicon preferentially within the opening to form a trench, with a gas mixture that includes an etching gas, a non-chlorinated sidewall passivating gas comprising oxygen, and an ionized inert gas;

maintaining the gas mixture in a pressure range of 0.7 to 1.1 Torr; and

selecting a passivating gas ratio in the mixture to determine the relative anisotropy of the etch wherein both isotropic and anisotropic etching can be achieved.

5,182,235
MANUFACTURING METHOD FOR A SEMICONDUCTOR DEVICE HAVING A BIAS SPUTTERED INSULATING FILM

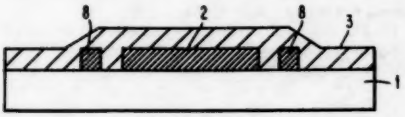
Kouzi Eguchi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 224,171, Jul. 25, 1988, Pat. No. 5,028,981, which is a continuation of Ser. No. 932,221, Nov. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 809,883, Dec. 17, 1985, abandoned. This application May 22, 1991, Ser. No. 703,945

Claims priority, application Japan, Feb. 20, 1985, 60-33735

Int. Cl.[5] H01L *21/283*

U.S. Cl. 437—238 4 Claims



1. A method of manufacturing a semiconductor device, comprising the steps of:

providing a semiconductor substrate;

simultaneously forming a conductive interconnection film on a predetermined region of said substrate while forming a dummy pattern about the outer periphery of said conductive interconnection film and in spaced relation to said film, said dummy pattern being formed of electrically isolated conductive film and by utilizing the same mask as that employed for the interconnection; and

providing an insulating film on said semiconductor substrate by the bias sputtering method to cover said conductive interconnection film and said conductive dummy pattern whereby said dummy pattern has no electrical connection anywhere within said semiconductor device and is thereby electrically isolated from any electrically conductive structures within the device.

5,182,236
GRADIENT INDEX GLASSES AND SOL-GEL METHOD FOR THEIR PREPARATION

J. Brian Caldwell, Highland Park, N.J.; Mark A. Banash, Newtown; Tessie M. Che, both of Newtown, Pa.; Robert M. Mininni, Skillman, N.J., and Victor N. Warden, Hillsborough, N.J., assignors to Enichem S.p.A., Milan, Italy and Istituto Guido Donegani S.p.A., Novara, both of, Italy

Filed Sep. 24, 1991, Ser. No. 764,453

Int. Cl.[5] C03C *4/00*

U.S. Cl. 521—12 25 Claims

1. A gradient index glass comprised of $(SiO_2)_m(R_2O)_nX_p$, wherein R is at least one member selected from the group consisting of Li, Na, K, Rb and Cs, X is at least one member selected from the group consisting of TiO_2, ZrO_2, and HfO_2, m is 40 to 99, n is 0.25 to 20, p is at least 0.1, and $m+n+p=100$, wherein said glass comprises a composition gradient of X and a uniform distribution of R_2O.

5,182,237
BOROSILICATE GLASS FOR ELECTRONIC FLASH LAMPS

Peter Brix, Mainz, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Apr. 17, 1991, Ser. No. 685,953

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1990, 4012288

Int. Cl.[5] C03C *3/091, 3/093*

U.S. Cl. 501—66 11 Claims

1. A uniformly clear finished borosilicate glass in the form of a hollow tube for electronic flash lamps consisting essentially of

SiO_2	50–75 wt. %
B_2O_3	11–18 wt. %
Al_2O_3	1–5 wt. %
Cs_2O	9–28 wt. %
Li_2O_3	0–3 wt. %
Na_2O	0–3 wt. %
K_2O	0–2 wt. %
ZnO	0–2 wt. %
MgO	0–2 wt. %
CaO	0–3 wt. %
SiO	0–3 wt. %
BaO	0–3 wt. %

wherein the total weight of alkali oxides, except for Cs_2O, has a maximum value of 5 wt. %, and the total weight of alkaline earth oxides plus ZnO falls within the range of 0–6 wt. %, and where wt. % is based on the weight of the total oxide, and optionally 1.5 wt. % based on the weight of the total oxides of a fining agent selected from the group consisting of Sb_2O_3, CrO_2, NaCl and As_2O_3.

5,182,238
PROTECTIVE LAYER OF HARD MATERIAL WITH HOMOGENEOUS DISTRIBUTION OF ELEMENTS

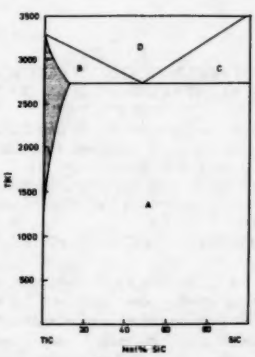
Helmut Holleck, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Filed Apr. 10, 1989, Ser. No. 335,601

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1988, 3811907

Int. Cl.[5] B32B *9/00*

U.S. Cl. 501—91 8 Claims



1. A primarily crystalline, titanium-containing protective layer of hard material having a homogeneous distribution of elements for a surface of a substrate material, the protective layer comprising a single, meta-stable mixed phase having a face-centered cubic crystal structure made of a metallic hard material which is at least one material selected from titanium nitride (TiN) or titanium carbide (TiC). and a covalent hard material which is at least one material selected from silicon carbide (SiC) or silicon nitride (Si_3N_4).

5,182,239

ALUMINUM NITRIDE GRANULES AND PROCESS FOR THE PREPARATION THEREOF

Kiyofumi Hirokawa, Shinnanyo, and Hitofumi Taniguchi, Tokuyama, both of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Tokuyama, Japan

Filed Jun. 13, 1991, Ser. No. 714,612
Claims priority, application Japan, Jun. 15, 1990, 2-155030
Int. Cl.[5] C04B *35/58*
U.S. Cl. 501—98 15 Claims

1. Aluminum nitride granules which are characterized in that

(a) they are composed mainly of aluminum nitride,

(b) their bulk density ranges from 0.5 to 1.5 g/cc,

(c) the mean granule diameter thereof is within the range of 20 to 500 μm, and

(d) they have a breaking strength of 0.5 to 5.0 g.

5,182,240

DIELECTRIC CERAMIC COMPOSITION OF BAO, TiO_2,ND_2O_3, SM_2O_3 AND AL_2O_3

Takami Hirai, Nishikamo, and Shinsuke Yano, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Aug. 15, 1991, Ser. No. 745,186
Claims priority, application Japan, Aug. 20, 1990, 2-219717
Int. Cl.[5] C04B *35/46*
U.S. Cl. 501—139 2 Claims

1. A dielectric ceramic composition consisting essentially of: barium oxide, titanium oxide, neodymium oxide and semarium oxide as major components which are represented by $xBaO - yTiO_2 - z[(1 - a)Nd_2O_3 - aSm_2O_3]$, where $0.10 \leqq x \leqq 0.20$, $0.60 \leqq y \leqq 0.75$, $0.10 \leqq z \leqq 0.25$, $x+y+z=1$, and $0 < a \leqq 0.50$; and wherein alumina is present in an amount of not more than 2.5 parts by weight of alumina per 100 parts by weight of a total amount of said major components.

5,182,241

TREATING ACCUMULATED WASTE WATER FROM PLASTIC SUBSTRATES ACTIVATED WITH PD/SN SOLUTIONS

Holger Kistrup, Esslingen, and Otwin Imhof, Nürtingen, both of Fed. Rep. of Germany, assignors to Deutsche Automobilgesellschaft mbH, Fed. Rep. of Germany

Filed Oct. 21, 1991, Ser. No. 780,113
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1990, 4033518
Int. Cl.[5] B01J *38/68*; C23C *16/00*; B05D *3/04*; C25D *5/54*
U.S. Cl. 502—24 3 Claims

1. A process for treating waste water which accumulates as used activation solution after activation has taken place in a one-step activation, on the basis of palladium/tin solutions, of large-surface plastic substrates for a subsequent chemical metallization in order to reuse said solutions as ready-to-use activation solutions, comprising the steps of adding a concentrate of palladium chloride an sodium chloride to the used activation solution at room temperature while stirring vigorously to form a mixture, then adding a solid tin salt to the mixture in a molar excess of 1:1.5 to 1:4, based on the palladium, while stirring vigorously to produce a solution enriched in palladium and tin ions, and then allowing the solution enriched in palladium and tin ions to stand for at least 10 minutes for maturation and use as a fresh, ready-to-use activation solution.

5,182,242

CATALYSTS BOUND WITH LOW ACIDITY REFRACTORY OXIDE

David O. Marler, Deptford, N.J., assignor to Mobil Oil Corp., Fairfax, Va.

Filed Jun. 2, 1992, Ser. No. 896,034
Int. Cl.[5] B01J *29/00, 37/00*
U.S. Cl. 502—66 22 Claims

1. A method for preparing a low acidity refractory oxide-bound molecular sieve composition which comprises:

a) providing a substantially homogenous mixture of molecular sieve, dispersant, a low acidity refractory oxide binder material and hydroxy-bridged metallopolymer, alkoxy-bridged metallopolymer or mixture thereof to provide a formable mass;

b) forming the formable mass resulting from step (a); and

c) calcining the formed product resulting from step (b).

3. The method of claim 1 wherein the molecular sieve component is a medium-pore zeolite.

17. The low acidity refractory oxide-bound molecular sieve composition resulting from the method of claim 1 which comprises a hydrogenation component.

5,182,243

PROCESS FOR PREPARING FLUIDIZED CRACKING CATALYSTS FROM EQUILIBRIUM FLUIDIZED CRACKING CATALYSTS

Stephen H. Brown, Princeton, and Roland von Ballmoos, Belle Mead, both of N.J., assignors to Englehard Corporation

Filed Nov. 1, 1991, Ser. No. 786,663
Int. Cl.[5] B01J *29/08*
U.S. Cl. 502—79 4 Claims

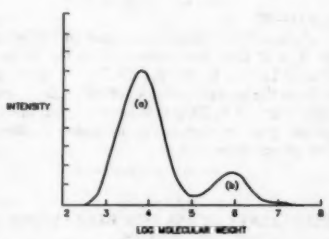
1. A process for treating an equilibrium catalyst comprising zeolite Y and a matrix which comprises contacting the same at a temperature in the range of 160° to 230° F. with a source of silica, a source of sodium oxide, water and an aqueous solution of clear amorphous seeds in order to destroy the zeolite Y originally present in said equilibrium catalyst and to regrow zeolite Y in the matrix of said equilibrium catalyst to a level not exceeding 70 weight percent in the as-synthesized form while substantially preserving the physical properties of said matrix.

5,182,244

TRANSITION METAL/RARE EARTH CATALYST AND OLEFIN POLYMERIZATION PROCESS

Ted. M. Pettijohn, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 19, 1991, Ser. No. 810,581
Int. Cl.[5] C08F *4/48*
U.S. Cl. 502—110 9 Claims



1. A process for producing a polymerization catalyst system comprising:

(1) contacting an organometal compound and a transition metal compound to produce a catalyst A; and

(2) contacting said catalyst A and a catalyst B comprising a rare earth complex having a formula $Cp_nMX_{4-n}M'L_x$, to form said catalyst system, wherein Cp is cyclopentadienyl or cyclopentadienyl substituted with an alkyl or alkyl silyl

radical, M is yttrium, scandium or a rare earth metal having an atomic number in the range of 57 to 71, M' is an alkali metal, L is a suitable electron donor ligand, X is a halogen, n is 1 or 2, and x is a number corresponding to the value needed to form a stable complex.

5,182,245

OLEFIN POLYMERIZATION AND COPOLYMERIZATION CATALYST

Gregory G. Arzoumanidis, Naperville, and Christine Peaches, Aurora, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jun. 26, 1991, Ser. No. 721,158
The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.
Int. Cl.[5] C08F 4/654
U.S. Cl. 502—115 21 Claims

1. A solid, hydrocarbon-insoluble catalyst or catalyst component for the polymerization or copolymerization of alpha-olefins in the slurry phase, comprising a product formed by:

A. forming a solution of a magnesium-containing species in a liquid, wherein the magnesium-containing species is formed by reacting a magnesium-containing compound with carbon dioxide or sulfur dioxide;

B. precipitating solid particles from the solution of the magnesium-containing species by treatment with a transition metal halide in the presence of at least one of a tetrabutoxysilane and a tetrabutoxytitanate; and

C. treating the precipitated particles with a transition metal compound and an electron donor.

5,182,246

CATALYST FOR HYDROGENATION, DEHYDROSILYLATION OR HYDROSILYLATION AND USE THEREOF

Takamasa Fuchikami, Kanagawa; Yumiko Ubukata, Tokyo, both of Japan, and Yasutaka Tanaka, Strasbourg, France, assignors to Sagami Chemical Research Center, Tokyo, Japan

PCT No. PCT/JP90/01708, § 371 Date Aug. 23, 1991, § 102(e) Date Aug. 23, 1991, PCT Pub. No. WO91/09674, PCT Pub. Date Jul. 11, 1991
PCT Filed Dec. 26, 1990, Ser. No. 752,646
Claims priority, application Japan, Dec. 26, 1989, 1-335207; Aug. 6, 1990, 2-206879; Aug. 6, 1990, 2-206880; Aug. 6, 1990, 2-206881
Int. Cl.[5] B01J 31/20
U.S. Cl. 502—161 1 Claim

1. A catalyst for hydrogenation, dehydrosilylation of ketones, or hydrosilylation of dienes or acetylenes, which comprises a complex represented by the formula:

$$A^+[M_2H(CO)_{10}]^-$$

wherein A^+ represents an alkali metal cation, an ammonium cation, an iminium cation, or a phosphonium cation; and M represents a chromium atom, a molybdenum atom, or a tungsten atom.

5,182,247

SULFATED CATALYST FOR SKELETAL ISOMERIZATION OF OLEFINS

Erven J. Kuhlmann, Hopewell Junction; James R. Pascoe, Fishkill; James E. Browne, Beacon, and Kevin J. Martin, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 11, 1991, Ser. No. 653,217
Int. Cl.[5] B01J 27/053
U.S. Cl. 502—217 1 Claim

1. A catalyst composition for the skeletal isomerization of normal olefins prepared by a process comprising the steps of:

(a) treating a dried catalyst precursor comprising at least one crystalline zirconia with a sulfating agent comprising zirconium sulfate to deposite sufficient suflate species to catalyze the skeletal isomerization of said normal olefins under isomerizing conditions without substantail cracking;

(b) drying the resulting sulfated catalyst precursor; and

(c) calcining the dried sulfated precursor to produce an activated catalyst comprising a solid acid.

5,182,248

HIGH POROSITY, HIGH SURFACE AREA ISOMERIZATION CATALYST

Ian A. Cody, Clearwater; David H. Dumfries, Sarnia-Clearwater, both of Canada; Arthur H. Neal, and Kenneth L. Riley, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 10, 1991, Ser. No. 699,101
Int. Cl.[5] B01J 21/04, 27/12, 27/13, 27/132
U.S. Cl. 502—230 22 Claims

1. A high porosity, high surface area catalyst comprising a catalytically active metal component on a fluorided refractory metal oxide support wherein the catalyst in its finished form has a porosity, expressed in terms of pore volume, of at least about 0.50 cc/gram and a surface area (in m^2/gram) such that the product of the porosity and the surface area is at least about 107.

5,182,249

NON-PRECIOUS METAL THREE WAY CATALYST

Ren Wang; Shanliang Wu, and Zhigang Zhang, all of Shanghai, China, assignors to East China University of Chemical Technology, Shanghai, China

Filed Feb. 6, 1991, Ser. No. 651,087
Claims priority, application China, Oct. 22, 1990, 90102964
Int. Cl.[5] B01J 23/10, 23/26, 23/34
U.S. Cl. 502—303 5 Claims

1. A catalyst for removal of carbon monoxide, hydrocarbons, and nitrogen oxides from exhaust gases, comprising:

a first carrier means;

a second carrier means, formed on said first carrier means, comprising

an oxide of a metal selected from the group consisting of aluminum, manganese, vanadium, chromium, molybdenum, iron, tungsten, titanium, potassium, zinc, barium and mixtures thereof, and

an oxide of a metal selected from the group consisting of lanthanum, cerium, yttrium and mixtures thereof;

a catalyzing layer, formed on said second carrier, comprising a mixture of:

i) oxides of aluminum, cerium, cobalt, lanthanum, manganese, nickel, and potassium;

ii) an oxide of a metal selected from the group consisting of barium, copper, chromium, iron, molybdenum, niobium, tantalum, titanium, vanadium, tungsten, zinc and mixtures thereof; and

iii) an oxide of a metal selected from the group consisting of europium, gadolinium, neodymium, praseodymium, thorium, samarium and mixtures thereof.

5,182,250

CATALYST COMPOSITION FOR HYDRODESULFURIZATION OF HYDROCARBON OIL AND PROCESS FOR PRODUCING THE SAME

Kazushi Usui, Chiba; Takashi Fujikawa, and Katsuyoshi Ohki, both of Saitama, all of Japan, assignors to Cosmo Research Institute and Cosmo Oil Co., Ltd., both of Tokyo, Japan

Filed Mar. 25, 1991, Ser. No. 674,251
Claims priority, application Japan, Mar. 23, 1990, 2-74622; Apr. 25, 1990, 2-109295
Int. Cl.[5] B01J 37/04, 23/85, 23/64, 21/06
U.S. Cl. 502—314 26 Claims

1. A process for producing a catalyst composition for the hydrodesulfurization of a hydrocarbon oil comprising a com-

posite of a metal oxide containing aluminum and at least one metal belonging to Group VIB of the Periodic Table or at least one metal belonging to Group VIII of the Periodic Table, which comprises:

drying and thereafter calcining an effective component obtained by mixing in essentially an organic solvent (c) an aluminum alkoxide, a chelate compound of aluminum or a mixture thereof, with

at least one selected from the group consisting of

(a) at least one compound of a metal belonging to Group VIB of the Periodic Table, and

(b) at least one compound of a metal belonging to Group VIII of the Periodic Table.

5,182,251

AMINOALKYLPHOSPHONIC ACID CONTAINING LIGANDS ATTACHED TO SOLID SUPPORTS FOR REMOVAL OF METAL IONS

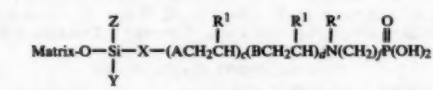
Ronald L. Bruening, Orem; Bryon J. Tarbet, Highland; Jerald S. Bradshaw, Provo; Reed M. Izatt, Orem, and Krzysztof E. Krakowiak, Provo, all of Utah, assignors to Brigham Young University, Provo, Utah

Filed Oct. 10, 1991, Ser. No. 774,547

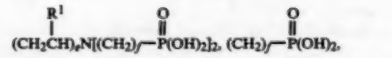
Int. Cl.[5] B01J *20/22*

U.S. Cl. 502—401 **15 Claims**

1. An aminoalkylphosphonic acid containing ligand-solid support compound of the formula:



wherein A, and B are members independently selected from the group consisting of O, NR, and $N(R)CH_2$ where R and R' are members independently selected from the group consisting of



$CH_2CH_2R^1$, hydrogen, lower alkyl, aralkyl, and aryl and substituted derivatives thereof; R^1 is a member independently selected from the group consisting of H, SH, OH, lower alkyl, aryl, and aralkyl; c and d are each integers from 0 to about 10; e and f are each integers from 1 to 10; X is a spacer grouping having the formula:

$$(CH_2)_a(OCH_2CHR^2CH_2)_b$$

wherein R^2 is a member selected from the group consisting of H, SH, OH, lower alkyl, aryl and aralkyl and substituted derivatives thereof; a is an integer from 3 to about 10; b is an integer of 0 or 1; Y and Z are members independently selected from the group consisting of Cl, Br, I, alkyl, alkoxy, substituted alkyl or substituted alkoxy and O-matrix; and matrix is selected from the group consisting of sand, silica gel, glass, alumina, zirconia, titania and nickel oxide or other hydrophilic inorganic supports and mixtures thereof.

5,182,252

FILM FOR A THERMAL TRANSFER INK RIBBON

Tsugio Nagasawa; Tadashi Shuto; Toshiaki Matsumoto; Hideo Sakuraya, and Shoji Nishimoto, all of Uji, Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed Dec. 5, 1990, Ser. No. 622,794

Claims priority, application Japan, Dec. 12, 1989, 1-322992

Int. Cl.[5] B41M *5/035, 5/26, 5/38*

U.S. Cl. 503—227 **7 Claims**

1. A film for a thermal transfer ink ribbon having excellent heat stick resistance, which comprises a base film made of a biaxially stretched thermoplastic resin film and a thermally meltable ink layer or a thermally sublimable ink layer formed on one side of the base film, wherein a thin layer composed of (A) a thermally reactive urethane prepolymer, (B) a fluorine polymer resin having a perfluoroalkyl group in its molecule, (C) a silicon compound having a hydroxyl group at each terminal of a dimethylpolysiloxane group, and (D) a polyvinyl alcohol having a saponification degree of at least 96 mol % and/or water-soluble starch, is formed on the other side of the base film at a rate of 0.05 to 0.5 g/m^2 as the total solid content of (A), (B), (C) and (D).

5,182,253

PURIFICATION APPARATUS FOR SUPERCONDUCTOR FINE PARTICLES

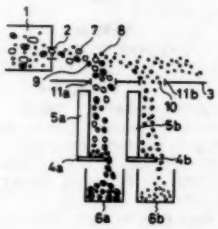
Fumio Kishi; Masatake Akaike; Keisuke Yamamoto, all of Atsugi; Taiko Motoi, Sagamihara; Norio Kaneko, Atsugi; Fujio Iwatate, Tokyo; Kazuaki Ohmi, Hadano; Takehiko Kawasaki, Atsugi, and Atsuko Shinjou, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 624,523, Dec. 10, 1990, abandoned, which is a continuation of Ser. No. 216,864, Jul. 7, 1988, abandoned. This application Sep. 30, 1991, Ser. No. 767,840

Claims priority, application Japan, Dec. 9, 1987, 62-309473; Mar. 29, 1988, 63-073363; Apr. 6, 1988, 63-083025; Apr. 6, 1988, 63-083026

Int. Cl.[5] H01L *39/24;* B03B *1/00;* B03C *1/02*

U.S. Cl. 505—1 **48 Claims**



1. A purification apparatus for superconductor fine particles, comprising;

means for forming a flow of powder containing the superconductor fine particles along a flow path;

means for applying a magnetic field to the flow of the powder; and

an electrical control for controlling said mean for applying a magnetic field and said means for forming a flow of powder, wherein the application of the magnetic field is synchronized with the flow of the powder by said electrical control.

5,182,254

SUPERCONDUCTING ELECTROMAGNETIC PROJECTILE LAUNCHERS

Frank J. Owens, Denville, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 20, 1992, Ser. No. 871,159

Int. Cl.[5] F41B *6/00*

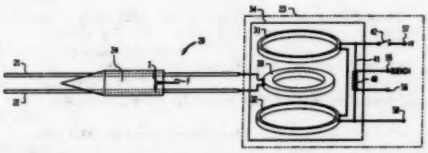
U.S. Cl. 505—1 **3 Claims**

1. An electromagnetic projectile launcher comprising:

a pair of conductive rails mounted parallel to each other in a common plane and including means for permitting a projectile to accelerate thereon:

a force coil comprising a flat circular coil including outputs connected in parallel to said rails for dumping a first electrical energy onto said rails whereby to launch said projectile along said rails;

superconducting circuit means for storing a second electrical energy, said superconducting circuit means comprising a pair of Helmholtz superconducting coils which sandwich said force coil inbetween, centered coaxially, but are not electrically conductive to said force coil; said Helmholtz coils being electrically coupled to one another and carrying common series current when in the superconductive state; said superconducting circuit means including a quenching means for selectively causing said superconducting coils to cease being superconductive, to cause said stored second electrical energy to collapse and induce said first electrical energy within said force coil, whereby said first electrical energy is dumped onto said rails, causing said projectile to be launched, said superconducting circuit means having a resistance in its non-superconducting state that is significantly higher than the resistance of said rails.



5,182,255

SHAPED AND FIRED ARTICLES OF $YBA_2CU_3O_7$

Kenton D. Budd, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation of Ser. No. 246,977, Sep. 20, 1988, abandoned. This application Feb. 28, 1991, Ser. No. 663,296

Int. Cl.[5] H01B *12/00*

U.S. Cl. 505—1 7 Claims

1. A fine diameter fiber comprising orthorhombic superconducting $YBa_2Cu_3O_x$, wherein x is in the range of from 6.5 to 7.2 and further wherein said fiber has a diameter greater than Oμ and less than or equal to about 50μ.

5,182,256

PROCESS AND APPARATUS FOR PREPARING SUPERCONDUCTING THIN FILMS

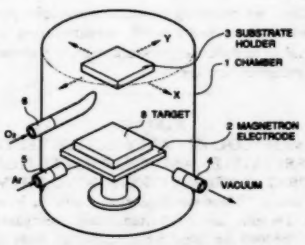
Hideo Itozaki; Hisao Hattori; Keizo Harada, and Kenjiro Higaki, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 21, 1991, Ser. No. 718,883

Claims priority, application Japan, Jun. 21, 1990, 2-163630; Jul. 10, 1990, 2-182487

Int. Cl.[5] H01L *39/24;* C23C *14/35*

U.S. Cl. 505—1 13 Claims



1. A process for preparing a thin film of high-temperature compound oxide superconductor on a substrate by a magnetron sputtering method, characterized in that the substrate and a sputtering target are arranged in parallel with each other in a vacuum chamber and one of the substrate and the target is moved reciprocally along two mutually perpendicular directions X, Y, and in parallel with the other while the thin film is formed by sputtering.

5,182,257

USE OF PURE HISTONES H1 AND H2A:H2B DIMERS IN THERAPEUTIC METHODS

Michael Zeppezauer, Saarbrücken-Scheidt, and Robert Reichhart, Homburg/Saar, both of Fed. Rep. of Germany, assignors to Volker Rusch, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 777,783, Sep. 12, 1985, Pat. No. 4,818,763. This application Apr. 3, 1989, Ser. No. 332,658

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1984, 3405620; Dec. 1, 1984, 3400928

Int. Cl.[5] A61K *37/00, 37/08;* C07K *13/00*

U.S. Cl. 514—2 9 Claims

1. A therapeutic method for treatment of radiation-induced leukemia or carcinoma of a patient in need thereof which comprises administering to said patient a biological composition which comprises a therapeutically acceptable carrier and, in a quantity having a therapeutic effect, a biologically active pure histone consisting of H1 or histone dimer H2A:H2B.

5,182,258

SYSTEMIC DELIVERY OF POLYPEPTIDES THROUGH THE EYE

George C. Y. Chiou, College Station, Tex., assignor to Orbon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 326,200, Mar. 20, 1989, abandoned. This application Sep. 26, 1989, Ser. No. 412,979

Int. Cl.[5] A61K *37/26, 37/64, 47/00*

U.S. Cl. 514—3 9 Claims

1. A method for delivering a polypeptide drug systemically, said method comprising:

administering a therapeutically effective concentration of the drug formulated in a pharmaceutically acceptable vehicle into the eye, said concentration being less than 10% w/v and the volume of the drug formulation is less than 75 ul; and

coadministering an effective amount of a permeation-enhancing agent with said drug;

whereby the drug passes into the nasolacrimal duct where it is absorbed into the circulation.

5,182,259

INTRAOCULAR ANTICOAGULANT INCLUDING ANTITHROMBIN III AND METHOD OF ADMINISTRATION

Kiyoshi Kita, No. 4-4-7-502, Honmachi, Shibuyaku, Tokyo, Japan

Filed Jul. 25, 1989, Ser. No. 391,323

Claims priority, application Japan, Jul. 25, 1988, 63-183680; Nov. 10, 1988, 63-282398

Int. Cl.[5] A61K *37/02, 47/36;* A61M *35/00*

U.S. Cl. 514—8 4 Claims

1. A method of preventing fibrin clot formation and viscoelastic material-inducing elevation in intraocular pressure in a patient in need thereof, comprising the steps of:

forming a solution including antithrombin III in an amount effective to present the viscoelastic material-induced elevation in intraocular pressure and a viscoelastic material; and

administering the solution into the ocular chamber during eye surgery.

5,182,260

DNA SEQUENCES ENCODING SNAKE VENOM INHIBITORS OF PLATELET ACTIVATION PROCESSES FOR PRODUCING THOSE INHIBITORS AND COMPOSITIONS USING THEM

John M. Maraganore, Tewksbury, Mass., and Joseph A. Jakubowski, Indianapolis, Ind., assignors to Biogen, Inc., Cambridge and Trustees of Boston University, Boston, both of, Mass.

Continuation-in-part of Ser. No. 303,585, Jan. 27, 1989, abandoned, and a continuation-in-part of Ser. No. 303,590, Jan. 27, 1989, abandoned. This application Nov. 1, 1989, Ser. No. 430,313

Int. Cl.[5] A61K *37/00;* **C07K** *13/00;* **C12N** *15/12*

U.S. Cl. 514—12 **9 Claims**

1. A snake venom polypeptide inhibitor of platelet activation substantially free of other snake venom components, wherein said polypeptide consists essentially of two homologous disulfide-linked polypeptide chains, each of said polypeptide chains having the amino acid formula: EAGEE CDCGS PENPC CDAAT CKLRP GAQCA EGLCC DQCKF MKEGT VCRRA RGDDV NDYCN GISAG CPRNP FH.

5,182,261

MODIFIED TRANSFORMING GROWTH FACTOR ALPHA OLIGOPEPTIDES AND PHARMACEUTICAL COMPOSITIONS THEREOF

James P. Tam, New York, N.Y., assignor to The Rockefeller University, New York, N.Y.

Filed Jul. 13, 1989, Ser. No. 379,332

Int. Cl.[5] A61K *37/36;* **C07K** *7/10*

U.S. Cl. 514—12 **20 Claims**

1. Transforming growth factor α modified by replacement of an L-amino acid residue with a D-amino acid residue.

5,182,262

CALMODULIN BINDING PEPTIDE DERIVATIVES OF NON-ERYTHROID ALPHA SPECTRIN

Thomas Leto, Washington, D.C., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Mar. 2, 1989, Ser. No. 318,172

Int. Cl.[5] A61K *37/00, 37/02;* **C07K** *5/00, 7/00*

U.S. Cl. 514—13 **30 Claims**

1. An isolated polypeptide which consists essentially of the following sequence: Lys-Thr-Ala-Ser-Pro-Trp-Lys-Ser-Ala-Arg-Leu-Met-Val-His-Thr-Val-Ala-Thr-Phe-Asn-Ser-Ile-Lys-Glu, a calmodulin binding active derivative thereof having said sequence as its nucleus, or a calmodulin binding active derivative having single or multiple amino acid substitutions, deletions or insertions and having the calmodulin binding activity of said sequence.

5,182,263

ANALOGS OF TYROSINE SULFATE OR TYROSINE PHOSPHATE CONTAINING PEPTIDES

Waleed Danho, Wayne; Jefferson W. Tilley, North Caldwell; Joseph Triscari, Bloomfield, and Rolf Wagner, West Milford, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 311,872, Feb. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 185,228, Apr. 25, 1988, abandoned. This application Jul. 18, 1991, Ser. No. 732,435

Int. Cl.[5] C07K *7/06;* **A61K** *37/02*

U.S. Cl. 514—16 **30 Claims**

28. A method for suppressing appetite in subjects by administering an appetite supressing efective amount of a compound selected from the group consisting of:

Ac—(D,L)—Phe(3-COOH)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D,L)=Phe(4-COOH)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D)—Phe(4-COOH)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—Phe(4-COOH)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D,L)=Phe(4-CH_2COOH)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D)=Phe(4-CH_2COOH)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—Phe(4-CH_2COOH)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D)—Phe(4-CH_2COOC_2H_5)—Met—Gly—Trp—Met—Asp—(COOC_2H_5)—Phe—NH_2

Ac—Phe(4-CH_2COOC_2H_5)—Met—Gly—Trp—Met—Asp—(COOC_2H_5)—Phe—NH_2

Ac—Phe(4-CH_2CH_2COOH)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D,L)=Phe(4-CF_2COOH)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D,L)=Phe(4-tetrazole)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D)=Phe(4-tetrazole)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—Phe(4-tetrazole)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Desamino=Phe(4-CH_2COOH)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D,L)—Phe(3-CH_2COOH)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D,L)=Phe(4-CH_2—tetrazole)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Desamino=Phe(4-CH_2COOH)—Nle—Gly—Trp—Nle—Asp—N—methyl—Phe—NH_2

Desamino=Phe(4-CH_2COOH)—Nle—(D)—Ala—Trp—Nle—Asp—N—methyl—Phe—NH_2

Desamino=Phe(4-tetrazole)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D)=Phe(4-CH_2—tetrazole)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—Phe(4-CH_2—tetrazole)—Met—Gly—Trp—Met—Asp—Phe—NH_2

Ac—(D,L)=Phe(4-CH_2—tetrazole)—Nle—Gly—Trp—Nle—Asp—N—methyl—Phe—NH_2

Ac—Phe(4-CH_2—tetrazole)—Nle—Gly—Trp—Nle—Asp—N—methyl—Phe—NH_2 and

Desamino—Phe(4-CH_2—tetrazole)—Nle—Gly—Trp—Nle—Asp—N—methyl—Phe—NH_2.

5,182,264

ANGIOTENSIN II RECEPTOR BLOCKERS AS ANTIGLAUCOMA AGENTS

Robert W. Watkins, Great Meadows, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 837,452, Mar. 7, 1986, Pat. No. 5,036,048. This application May 6, 1991, Ser. No. 696,374

Int. Cl.[5] A61K *31/475, 31/13, 31/54*

U.S. Cl. 514—16 **25 Claims**

1. A method for reducing elevated intraocular pressure in a mammal which comprises topically administering to an eye of said mammal an intraocular pressure reducing amount of angiotensin II receptor blocker.

5,182,265

PHARMACOLOGICALLY ACTIVE PEPTIDE DERIVATIVES AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Tiberio Bruzzese; Massimo Signorini; Carlo A. Fanciano, and Roberta Termini, all of Milan, Italy, assignors to SPA Societa' Prodotti Antibiotici S.p.A., Milan, Italy

Filed Aug. 3, 1990, Ser. No. 562,657

Claims priority, application Italy, Aug. 28, 1989, 21567 A/89

Int. Cl.[5] C07K *5/08*

U.S. Cl. 514—18 **7 Claims**

1. A peptide selected from the group consisting of:

H-Thr-Asp-Phe-OH

H-D-Thr-Asp-Tyr-OH

H-Thr-Asp-D-Tyr-OH

H-Ala-Asp-Tyr-OH

and pharmaceutically acceptable salts thereof.

5,182,266

METHOD FOR TREATING RENAL DISEASE

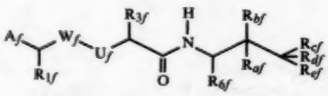
Hollis D. Kleinert, Buffalo Grove, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 632,595, Jan. 4, 1991, which is a continuation-in-part of Ser. No. 472,937, Jan. 31, 1990, abandoned. This application Feb. 14, 1992, Ser. No. 836,560

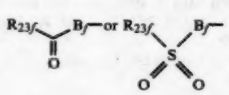
Int. Cl.[5] A61K *37/00*

U.S. Cl. 514—18 **4 Claims**

1. A method for treating or inhibiting renal dysfunction in a human comprising administering to said human a therapeutically effective amount of a compound of the formula:



wherein A_f is hydrogen, loweralkyl, arylalkyl, —OR_{10f} or —SR_{10f} wherein R_{10f} is hydrogen, loweralkyl or aminoalkyl, —$NR_{11f}R_{12f}$ wherein R_{11f} and R_{12f} are independently selected from hydrogen, loweralkyl, aminoalkyl, cyanoalkyl, hydroxyalkyl, carboxyalkyl, alkoxycarbonylalkyl, (amino)carboxyalkyl, ((N-protected)amino)carboxyalkyl, (alkylamino)carboxyalkyl, ((N-protected)alkylamino)carboxyalkyl, (dialkylamino)carboxyalkyl, (amino)alkoxycarbonylalkyl, ((N-protected)amino)alkoxycarbonylalkyl, (alkylamino)alkoxycarbonylalkyl, ((N-protected)alkylamino)alkoxycarbonylalkyl and (dialkylamino)alkoxycarbonylalkyl; or A_f is



wherein B_f is NH, alkylamino, S, O, CH_2 or CHOH and $R23_f$ is loweralkyl, cycloalkyl, aryl, arylalkyl, alkoxy, alkenyloxy, hydroxyalkoxy, dihydroxyalkoxy, arylalkoxy, arylalkoxyalkyl, amino, alkylamino, dialkylamino, (hydroxyalkyl)(alkyl)amino, (dihydroxyalkyl(alkyl)amino, aminoalkyl, N-protectedaminoalkyl, alkylaminoalkyl, (N-protected)(alkyl)aminoalkyl, dialkylaminoalkyl, carboxyalkoxyalkyl, (alkoxycarbonyl)alkoxyalkyl, carboxyalkyl, carboxyalkylamino, alkoxycarbonylalkyl, alkoxycarbonylalkylamino, (amino)carboxyalkyl, (amino)carboxyalkylamino, ((N-protected)amino)carboxyalkyl, ((N-protected)amino)carboxyalkylamino, (alkylamino)carboxyalkyl, (alkylamino)carboxyalkylamino, ((N-protected)alkylamino)carboxyalkyl, ((N-protected alkylamino)carboxyalkylamino, (dialkylamino)carboxyalkyl, (dialkylamino)carboxyalkylamino, (amino)alkoxycarbonylalkyl, (amino)alkoxycarbonylalkylamino, ((N-protected)amino)alkoxycarbonylalkyl, ((N-protected)amino)alkoxycarbonylalkylamino, (alkylamino)alkoxycarbonylalkyl, (alkylamino)alkoxycarbonylalkylamino, ((N-protected)alkylamino)alkoxycarbonylalkyl, ((N-protected)alkylamino)alkoxycarbonylalkylamino, (dialkylamino)alkoxycarbonylalkyl, (dialkylamino)alkoxycarbonylalkylamino, aminocycloalkyl, aminoalkylamino, dialkylaminoalkyl(alkyl)amino, arylalkylamino, arylalkyl(alkyl)amino, alkoxyalkyl(alkyl)amino,(polyalkyoxy)alkyl(alkyl)amino, di-(alkoxyalkyl)amino, di-(hydroxyalkyl)amino, di-((polyalkoxy)alkyl)amino, polyalkoxy, (polyalkoxy)alkyl, (heterocyclic)alkyl or a substituted or unsubstituted heterocyclic wherein saturated heterocyclics may be unsubstituted, monosubstituted or disubstituted with hydroxy, oxo amino, alkylamino, dialkylamino, alkoxy, polyalkoxy or loweralkyl; unsaturated hetercyclics may be unsubstituted or monosubstituted with hydroxy, amino, alkylamino, dialkylamino, alkoxy, polyalkoxy or loweralkyl;

W_f is C=O or CHOH;

U_f is CH_2 or NR_{2f} provided that when W_f is CHOH then U_f is CH_2; R_{1f} is loweralkyl, cycloalkylmethyl, benzyl, 4-methoxybenzyl, halobenzyl, (1-naphthyl)methyl, (2-naphthyl)methyl, (4-imidazolyl)methyl, (alpha,alpha)dimethylbenzyl, 1-benzyloxyethyl, phenethyl, phenoxy, thiophenoxy, or anilino; provided that when R_{1f} is phenoxy, thiophenoxy or anilino, then B_f is CH_2 or CHOH or A_f is hydrogen;

R_{2f} is hydrogen or loweralkyl;

R_{3f} is loweralkyl, loweralkenyl,((alkoxy)alkoxy)loweralkyl, (thioalkoxy)alkyl, benzyl or heterocyclic ring substituted methyl;

R_{6f} is loweralkyl, cycloalkylmethyl or benzyl;

R_{af} is vinyl, formyl, hydroxymethyl or hydrogen;

R_{df} is hydrogen or loweralkyl;

R_{bf} and Ref are independently selected from OH and NH_2; and

R_{cf} is hydrogen, loweralkyl, vinyl or arylalkyl; or a pharmaceutically acceptable salt, ester or prodrug thereof.

5,182,267

ANTI-CANCER ACTIVITY POTENTIATOR

Osamu Ogawa, Shiki; Ikuo Kishi, Ichikawa; Yoshiyuki Tahara, Tsurugashima, and Masanori Sugita, Sakado, all of Japan, assignors to Lederle (Japan), Ltd. and Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Division of Ser. No. 390,875, Aug. 8, 1989, Pat. No. 5,004,756. This application Dec. 12, 1990, Ser. No. 626,302

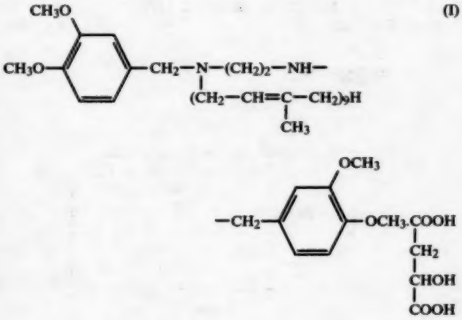
Claims priority, application Japan, Aug. 11, 1988, 63-198795

Int. Cl.[5] A61K *31/70, 31/35*

U.S. Cl. 514—34 **6 Claims**

1. A method of potentiating the anti-cancer activities of adriamycin which comprises intravenously administering to a warm-blooded animal an effective amount of adriamycin in combination with an effective amount of a micro-emulsion which comprises

fine particles of a vegetable oil or a triglyceride of a medium-chain fatty acid having 8 to 12 carbon atoms containing 0.1 to 10% (w/v) of N-solanesyl-N,N'-bis(3,4-dimethoxybenzyl)ethylenediamine malate of formula (I) below,



(I)

in an aqueous medium, and

0.05 to 25% (w/v) of a physiologically acceptable phospholipid for dispersing said fine particles in said aqueous medium.

5,182,268
PHARMACEUTICAL COMPOSITION COMPRISING DAUNORUBICIN POTENTIATED WITH 2,4,5-TRI (4-METHOXYPHENYL)-4,5-DIHYDROIMIDAZOLE

Nahed K. Ahmed, Prairie Village, Kans., assignor to Marion Merrell Dow, Inc., Cincinnati, Ohio

Continuation of Ser. No. 440,122, Nov. 22, 1989, abandoned. This application Jul. 26, 1991, Ser. No. 737,570
Int. Cl.[5] A01N *43/04, 43/42;* A61K *31/33, 31/70*
U.S. Cl. 514—39 1 Claim

1. A pharmaceutical composition useful for treatment of a cancer comprising, 2,4,5-tri (4-methoxyphenyl)-4,5-dihydroimidazole, or pharmaceutically acceptable salt thereof, in combination with daunorubicin.

5,182,269
COMPOSITION FOR TOPICAL USE HAVING HAIR STIMULATING, ANTI-DANDRUFF AND ANTI-SEBORRHOIC ACTIVITY

Giovanni Gazzani, Appiano Gentile, Italy, assignor to Crinos Industria Farmacobiologica SpA, Como, Italy

Division of Ser. No. 248,692, Sep. 23, 1988, abandoned. This application Feb. 11, 1991, Ser. No. 652,499
Claims priority, application Italy, Sep. 23, 1987, 21990 A/87
Int. Cl.[5] A61K *31/70, 7/06, 7/075*
U.S. Cl. 514—44 11 Claims

1. A method for stimulating the growth of hair which comprises applying to the scalp of a patient a hair-growth stimulating amount of a depolymerized deoxyribonucleic acid having the following analytical composition:

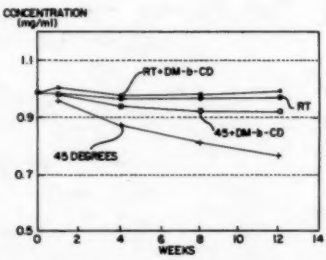
molecular weight	180,000-20,000 Daltons
total nitrogen	13–15%
total phosphorus	8–9.6 %
deoxyribose	17–24%
adenine	8–10%
guanine	7–9.5%
cytosine	5.5–7.5%
thymine	8–11%
$\frac{A+G}{T+C}$	0.87–1.01%

the percentage data being on dry basis.

5,182,270
STABILIZING PREPARATION FOR THYMOXAMINE

Donald G. Musson, and Orest Olejnik, both of Upland, Calif., assignors to Iolab Corporation, Claremont, Calif.

Filed Aug. 3, 1989, Ser. No. 389,153
Int. Cl.[5] A61K *31/72, 31/215*
U.S. Cl. 514—58 8 Claims



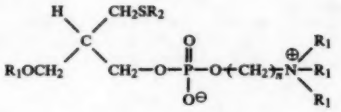
1. A chemical formulation for preventing hydrolysis of thymoxamine, comprising:
a therapeutic quantity of thymoxamine hydrochloride; and
a sufficient quantity of dimethyl-beta-cyclodextrin to form inclusion compounds with said thymoxamine.

5,182,271
THIOETHER, KETO-ESTER AND ALKYL PHOSPHOLIPIDS USEFUL IN TREATING MULTIPLE SCLEROSIS

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 533,246, Jun. 5, 1990, Pat. No. 5,064,816, which is a continuation-in-part of Ser. No. 489,578, Mar. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 423,323, Oct. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 392,187, Aug. 10, 1989, abandoned. This application Aug. 30, 1991, Ser. No. 752,739
Int. Cl.[5] A61K *31/685, 31/67, 31/66*
U.S. Cl. 514—77 9 Claims

1. A method of treating multiple sclerosis comprising administering to a subject afflicted therewith a therapeutically effective amount of a compound of formula II:


II

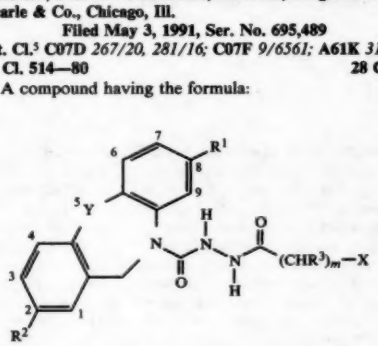
where
R_2 is n-C_{14}–C_{20}alkyl;
each R_1, independently, is methyl or ethyl; and
n is an integer 2 to 6.

5,182,272
8-SUBSTITUTED-DIBENZ[B,F][1,4]OXAZEPINE-10(11)-CARBOXYLIC ACID, SUBSTITUTED HYDRAZIDES, PHARMACEUTICAL COMPOSITIONS, AND METHODS FOR TREATING PAIN

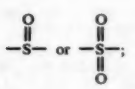
E. Ann Hallinan, Evanston; Robert K. Husa, and Karen B. Peterson, both of Vernon Hills, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 3, 1991, Ser. No. 695,489
Int. Cl.[5] C07D *267/20, 281/16;* C07F *9/6561;* A61K *31/55*
U.S. Cl. 514—80 28 Claims

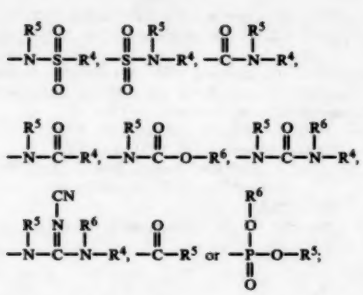
1. A compound having the formula:



or a pharmaceutically-acceptable salt thereof, wherein:
Y is oxygen, sulfur,



R^1 is hydrogen, halogen or $—CF_3$;
R^2 is hydrogen, halogen, —OH or $—OCH_3$;
R^3 is hydrogen, alkyl, aryl, alkyl-substituted aryl or aryl-substituted alkyl;
m is an integer of from 1 to 5;
X is



R^4 is hydrogen, alkyl, aryl, alkyl-substituted aryl, trifluoromethyl-substituted aryl or aryl-substituted alkyl; and

R^5 and R^6 are each independently hydrogen, alkyl, aryl, alkyl-substituted aryl or aryl-substituted alkyl wherein the term "aryl" used throughout the claim is defined to mean any of the following groups: phenyl, thienyl, furanyl, pyridinyl, imidazolyl, pyrimidyl, (is)oxazolyl, thiazolyl, triazolyl, tetrazolyl or pyrrolyl.

27. A method for treating pain in a mammal comprising administering to said mammal a therapeutically-effective amount of a compound of claim 1.

5,182,273

SPIROCYCLIC N, O DERIVATIVES OF CYCLOTRIPHOSPHAZENES AND THEIR USE IN THERAPY

Alain Duflos; Jean-Francois Patoiseau; Dennis Bigg, and Robert Kiss, all of Castres, France, assignors to Pierre Fabre Medicament, Boulogne, France

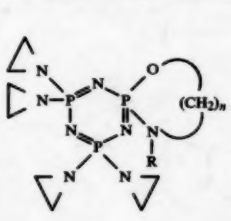
Filed Oct. 22, 1991, Ser. No. 780,480

Claims priority, application France, Oct. 23, 1990, 90 13103

Int. Cl.[5] A61K *31/395*; C07D *403/14*

U.S. Cl. 514—83 **15 Claims**

1. A compound selected from those having the Formula I



I

in which:

R represents hydrogen, linear, branched or cyclic C_{1-6} alkyl, phenyl, or alkylphenyl phenyl $(CH_2)_m$—, m being 1 to 4 inclusive, and

n=2, 3, or 4.

5,182,274

STABILIZED AQUEOUS PREPARATION OF ACTIVE FORM OF VITAMIN D_3

Yuji Makino; Hideo Matugi, and Yoshiki Suzuki, all of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP89/00959, § 371 Date May 25, 1990, § 102(e) Date May 25, 1990, PCT Pub. No. WO90/03173, PCT Pub. Date Apr. 5, 1990

PCT Filed Sep. 21, 1989, Ser. No. 490,637

Claims priority, application Japan, Sep. 26, 1988, 63-238971

Int. Cl.[5] A61K *31/59*

U.S. Cl. 514—167 **7 Claims**

1. An aqueous preparation of active form of vitamin D_3, comprising the active form of Vitamin D_3, a nonionic surface active agent, an antioxidant and at least one chelating agent selected from the group consisting of citric acid, tartaric acid and metal salts thereof,

wherein the active form of Vitamin D_3 is (i) solubilized with the nonionic surface active agent and (ii) stabilized with a combination of the antioxidant and the at least one chelating agent,

wherein the amount of said at least one chelating agent is 100 to 10,000 parts by weight per 1 part by weight of the active form of Vitamin D_3, and

wherein the active form of vitamin D_3 is at least one selected from the group consisting of 1α,24-dihydroxycholecalciferol, 1α-hydroxycholecalciferol, 1α,25-dihydroxycholecalciferol, and 1α,25-dihydroxycholecalciferol-26,23-lactone.

5,182,275

DIHYDRO-4(HYDROXYALKYENEAMINO)QUINOLINES

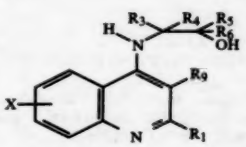
Karl Schonafinger, Alzenau, Fed. Rep. of Germany, and Helen H. Ong, Whippany, N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.

Division of Ser. No. 164,596, Mar. 7, 1988, Pat. No. 4,942,168, which is a division of Ser. No. 72,832, Jul. 13, 1987, Pat. No. 4,743,601. This application May 10, 1990, Ser. No. 521,510

Int. Cl.[5] A61K *31/54, 31/535, 31/47*; C07D *295/06*

U.S. Cl. 514—222.8 **27 Claims**

1. A compound having the formula



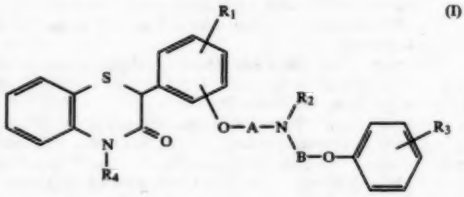
where X is hydrogen, loweralkyl, loweralkoxy, hydroxy, halogen, nitro or trifluoromethyl; R_1 is hydrogen or loweralkyl; R_3 and R_4 are independently hydrogen or loweralkyl; R_5 and R_6 are independently hydrogen or loweralkyl, or R_5+R_6 taken together with the carbon atom to which they are attached constitute a [cyclopropane, cyclobutane, cyclopentane, cyclohexane,] pyrrolidine, piperidine, morpholine or thiomorpholine ring, or R_5 is hydrogen and R_6 is phenyl or $—CH_2OR_8$ wherein R_8 is hydrogen, loweralkyl or loweralkylcarbonyl, and R_9 is hydrogen or bromine a pharmaceutically acceptable acid addition salt thereof, with the proviso that when $R_1=R_3=R_4=R_5=R_6=R_9=H$, X is not hydrogen or 7-chloro).

5,182,276
NOOTROPIC AGENT

Yasufumi Shirasaki, and Shinichiro Ashida, both of Tokyo, Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka and Daiichi Pharmaceutical Co., Ltd., Tokyo, both of, Japan

PCT No. PCT/JP90/00773, § 371 Date Dec. 27, 1990, § 102(e) Date Dec. 27, 1990, PCT Pub. No. WO90/15607, PCT Pub. Date Dec. 27, 1990
PCT Filed Jun. 14, 1990, Ser. No. 623,657
Claims priority, application Japan, Jun. 16, 1989, 1-153646
Int. Cl.[5] A61K *31/54*; C07D *279/16*
U.S. Cl. 514—224.2 4 Claims

1. A method for improving cerebral function which comprises administering an effective amount of a compound represented by Formula (I) or salts thereof to a patient suffering from a disease which is accompanied by a lowering of cerebral function:



(I)

wherein R_1 represents one or more functional groups selected from the group consisting of a hydrogen atom, a lower alkyl group, a halogen atom, a nitro group, a hydroxyl group, a lower alkylamino group and a lower alkoxycarbonyloxy group; R_2 represents a hydrogen atom, a lower alkyl group or a cycloalkyl group having 3 to 6 carbon atoms; R_3 represents one or more functional groups selected from the group consisting of a hydrogen atom, a lower alkyl group, a halogen atom, a nitro group, a hydroxl group, a lower alkoxy group, a lower alkylenedioxy group, a lower alkanoyl group, a lower alkanoyloxy group, an amino group, a lower alkylamino group, a lower alkanoylamino group and a lower alkoxycarbonyloxy group, or a group:

R_4 represents a hydrogen atom or a lower alkyl group; A and B may be the same or different and each represents a lower alkylene group having 1 to 6 carbon atoms; and n is 3 or 4.

5,182,277
FUNGICIDES AND PLANT-GROWTH CONTROLLING AGENTS

Thomas Strumpf, Potsdam; Horst Lyr, Eberswalde; Dieter Zanke, Potsdam-Babelsberg; Gerlinde Zollfrank, Potsdam, all of Fed. Rep. of Germany; Gyula Oros; Ferenc Viranyi, both of Budapest, Hungary, and Tibor Ersek, Columbia, Mo., assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Continuation-in-part of Ser. No. 835,608, Mar. 3, 1986, Pat. No. 4,983,207, which is a continuation-in-part of Ser. No. 344,009, Apr. 26, 1989, Pat. No. 4,954,495. This application Mar. 9, 1990, Ser. No. 492,066
Int. Cl.[5] A61K *31/535*
U.S. Cl. 514—231.2 6 Claims

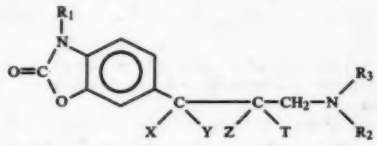
1. A synergistic fungicidal composition which comprises:
(A) N-cyclododecyl-2,6-dimethylmorpholine, or an agriculturally acceptable salt thereof, and
(B) 2-chloro-N-(2,6-dimethylphenyl)-N-(tetrahydro-2-oxo-3-furanyl)-acetamide, wherein the weight ratio of the Compound (A) to the Compound (B) is 4:1 to 1:1.

5,182,278
ANALGESIC BENZOXAZOLINONES HAVING AT THE 6-POSITION A 1-HYDROXY-3-MORPHOLINOPROPYL SIDE CHAIN

Daniel Lesieur, Gondecourt; Charles Lespagnol, Lambersart, and Jacqueline Bonnet, Paris, all of France, assignors to Adir et Compagnie, Neuilly-sur-Seine, France

Division of Ser. No. 485,057, Feb. 26, 1990, Pat. No. 5,132,305. This application Jul. 29, 1991, Ser. No. 737,322
Claims priority, application France, Feb. 28, 1989, 89 02554
Int. Cl.[5] C07D *413/06*
U.S. Cl. 514—233.8 6 Claims

1. A compound selected from those formula (I):



(I)

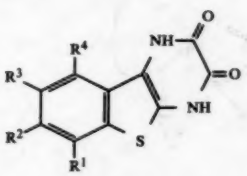
in which:
R_1 denotes a hydrogen atom or a lower alkyl group optionally substituted with a hydroxyl group,
R_2 and R_3 form, with the nitrogen atom to which they are attached a morpholino group,
X denotes a hydrogen atom,
Y denotes a hydroxyl group,
Z denotes a hydrogen atom, and
T denotes a hydrogen atom or lower alkyl group,
the term lower indicating that the groups so described have 1 to 6 carbon atoms inclusive,
their stereoisomers, their quaternary ammonium salts and their addition salts with a pharmaceutically, acceptable acid.

5,182,279
BENZOTHIENOPYRAZINEDIONE COMPOUNDS AND THEIR PREPARATION AND USE

Anker S. Jorgensen, Copenhagen; Carsten E. Stidsen, Bagsvaerd; Peter Faarup, Vaerlose; Frederik C. Gronvald, Vedbaek, and Flemming E. Nielsen, Virum, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed Apr. 18, 1991, Ser. No. 688,008
Claims priority, application Denmark, Apr. 24, 1990, 1012/90
Int. Cl.[5] A61K *31/495*; C07D *495/04, 333/66, 333/62*
U.S. Cl. 514—250 6 Claims

1. A compound of formula (I)



(I)

wherein
R^1, R^2, R^3 adn R^4 independently are hydrogne, halogen, C_{1-6}-alkyl, C_{1-6}-alkoxy or trifluoromethyl; or a pharmaceutically acceptable salt thereof.

5,182,280

DERIVATIVES OF BENZIMIDAZOLE AND THEIR USE AS ANTIHISTAMINES

Maria R. Cuberes-Altisent; Jordi Frigola-Constansa, and Juan Pares-Corominas, all of Barcelona, Spain, assignors to Laboratorios Del Dr. Esteve, S. A., Barcelona, Spain

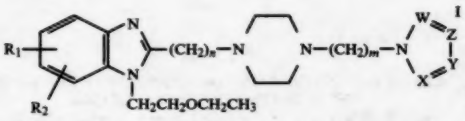
Filed Jul. 25, 1991, Ser. No. 735,653

Claims priority, application France, Jul. 26, 1990, 90 09563

Int. Cl.[5] A61K *31/495;* C07D *403/14*

U.S. Cl. 514—252 4 Claims

1. Compounds derived from benzimidazole characterized in that they correspond to the formula I, or their therapeutically acceptable salts,



in which,

R_1 and R_2, equal or different, represent a hydrogen atom, a halogen, a lower alkyl radical or a hydroxy radical,

n can have the values 0 or 1,

m can have the values 2 to 4,

X, Y, Z and W are equal or different, and represent a nitrogen atom or a carbon atom bonded to a hydrogen atom, to a halogen or to another lower alkyl, alkoxycarbonyl having up to two carbon atoms in its alkyl group, carboxy, hydroxyl or sulfo radical.

5,182,281

(OMEGA-(4-(2-PYRIMIDINYL)-1-PIPERAZINYL)ALKYL)-1H-AZOLE DERIVATIVES FOR THE TREATMENT OF DISORDERS OF COGNITIVE FUNCTIONS

Jordi Frigola-Constansa, and Juan Pares-Corominas, both of Barcelona, Spain, assignors to Laboratorios Del Dr. Esteve, S.A., Barcelona, Spain

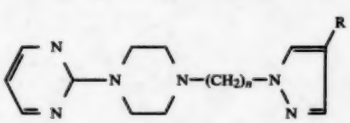
Filed Jan. 24, 1992, Ser. No. 824,995

Claims priority, application France, Jan. 25, 1991, 91 00861

Int. Cl.[5] A61K *31/50, 31/495*

U.S. Cl. 514—252 2 Claims

1. Process of treating a patient suffering from loss of cognitive function which comprises administering to said patient an effective amount of at least one compound of formula I



(I)

in which:

n can have values 1 to 6, and

R represents a hydrogen atom, a halogen, a C_1 to C_4 lower alkyl radical, a heteroaryl radical, a sulpho radical, an N-substituted or N,N-disubstituted sulphamoyl radical, a nitro radical, a hydroxyl radical, an oxo radical, a C_1 to C_4 lower alkoxy radical, a cyano radical, a C_1 to C_4 lower alkylcarboxylate radical, an aryl or substituted aryl radical, or an amino or substituted amino radical of formula

in which

R_1 and R_2, which may be identical or different, represent a hydrogen atom, an alkyl radical, an aryl radical, an alkylcarbonyl radical, an arylcarbonyl radical, an alkylsulphonyl radical or an arylsulphonyl radical, the alkyl fragments of these radicals containing from 1 to 4 carbon atoms,

and the therapeutically acceptable salts of such compounds.

5,182,282

4-BENZYL-1H-INDOLE DERIVATIVES

Francois Clemence; Jacques Guillaume, both of Paris, and Gilles Hamon, Le Raincy, all of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 514,695, Apr. 26, 1990, Pat. No. 5,086,070.

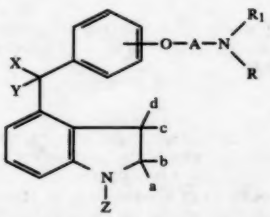
This application Oct. 11, 1991, Ser. No. 781,070

Claims priority, application France, Apr. 28, 1989, 89 05650

Int. Cl.[5] A61K *31/495;* C07D *403/02*

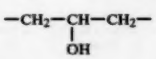
U.S. Cl. 514—253 19 Claims

1. A compound selected from the group consisting of racemic or diastereoisomer forms of a 4-benzyl-1H-indole compound of the formula

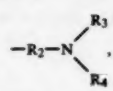


I

wherein R_1 and R taken together with the nitrogen to which they are attached form morpholino or piperazyinyl optionally substituted with at least one member of the group consisting of alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms, phenyl, naphthyl, aralkyl and diaralkyl of 7 to 14 carbon atoms, A is



or $-(CH_2)_n-$, n is 2, 3, 4 or 5, X and Y are both hydrogen or one is hydrogen and the other is selected from the group consisting of —OH, alkoxy and alkyl of 1 to 4 carbon atoms, or X and Y together form a member of the group consisting of =O, alkylidene of 1 to 4 carbon atoms, a, b, c and d are all hydrogen or a and b form =O and c and d are hydrogen or one of a and b with one of c and d form a carbon-carbon bond and the others are both hydrogen, Z is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, alkenyl and alkynyl of 2 to 5 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms and aralkyl of 7 to 14 carbon atoms, all optionally substituted with at least one member of the group consisting of —OH, halogen and alkyl and alkoxy of 1 to 5 carbon atoms and



R_2 is alkylene of 2 to 5 carbon atoms, R_3 and R_4 are individually selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms and aralkyl of 7 to 12 carbon atoms, all optionally substituted with at least one substituent selected from the group consisting of halogen, alkyl or alkoxy of 1 to 5 carbon atoms, hydroxy, trifluoromethyl, methylthio, nitro, amino and monoalkylamino or dialkylamino

where in alkyl of 1–5 carbon atoms or taken together with the nitrogen to which they are attached form morpholino or piperazinyl optionally substituted with at least one member of the group consisting of alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms, phenyl, naphthyl and aralkyl and diaralkyl of 7 to 14 carbon atoms or its non-toxic, pharmaceutically acceptable acid addition salts.

5,182,283

HETEROCYCLIC COMPOUNDS THEIR PREPARATION AND USE

John S. Ward, Indianapolis, Ind., assignor to Novo Nordisk A/S, Bagsvaerd, Denmark

Filed Mar. 15, 1991, Ser. No. 669,835

Claims priority, application Denmark, Mar. 21, 1990, 0727/90

Int. Cl.[5] A61K *31/495;* **C07D** *401/04*

U.S. Cl. 514—254 **35 Claims**

1. A compound which is 3-(3-Methoxypyrazinyl)-1,2,5,6-tetrahydro-1-methyl-pyridine or a pharmaceutically-acceptable salt thereof.

22. A compound which is 3-(3-Propyloxypyrazinyl)-1,2,5,6-tetrahydro-1-methyl-pyridine or a pharmaceutically-acceptable salt thereof.

5,182,284

PIPERAZINE COMPOUNDS, PROCESSES FOR PREPARATION THEREOF AND MEDICAL USES THEREOF

Masahiro Suzuki; Kenji Nozaki, both of Hannou; Makoto Kajitani, Irumagun; Mitsugi Yasumoto, Honjo; Naohiko Ono, and Takashi Shindo, both of Tokushima, all of Japan, assignors to Taibo Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP91/00060, § 371 Date Sep. 25, 1991, § 102(e) Date Sep. 25, 1991, PCT Pub. No. WO91/11444, PCT Pub. Date Aug. 8, 1991

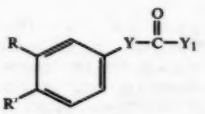
PCT Filed Jan. 1, 1991, Ser. No. 761,974

Claims priority, application Japan, Jan. 26, 1990, 2-16583

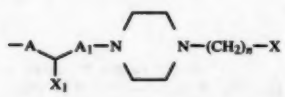
Int. Cl.[5] A61K *31/495;* **C07D** *295/00, 241/04*

U.S. Cl. 514—255 **20 Claims**

1. A piperazine compound represented by the formula

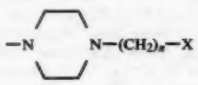


wherein R and R′ are the same or different and each represents a hydroxy group, a lower alkoxy group, a halogen atom, a hydrogen atom, a di(lower alkyl) hydrogenphosphate residue or a group —OR″ (wherein R″ is an aralkyl hydrocarbon group, a lower alkoxycarbonyl group, an amino acid residue, a lower alkylcarbonyl group or a lower alkylcarbamoyl group), or R and R′ taken together form a methylenedioxy group, Y is —CH=CH— or —$(CH_2)_m$— (wherein m is 0, 1 or 2), and Y_1 is a group represented by the formula (2)



(2)

(wherein A is —NH— or —O—, A is a methylene group or a carbonyl group, n is 6 to 20, X is a hydroxy group, a hydrogen atom or a lower alkoxycarbonyl group, and X_1 is a phenyl group which may be substituted with a halogen atom or a hydrogen atom), or a group represented by the formula (3)



(3)

(wherein X and n are as defined above), provided that when Y is the group of the formula (3), each of R and R′ is a hydroxy group; or a pharmaceutically acceptable salt thereof.

5,182,285

CELL-PROTECTIVE COMPOSITION FOR PREVENTING OR TREATING OF PEPTIC ULCER

Evzen Kasafirek; Václav Plaisner; Libuse Korbová; Jirj Kohout; Jirina Cizková; Ivan Krejci; Arnost Pospisil; Milan Pesak; Antonín Sture; Jirí Krepelka; Antonín Dlabac, all of Praha, and Jirí Vanzura, Hradec Králové, all of Czechoslovakia, assignors to Spojene Podniky Pro Zdravotnickou Vyrobu, Praha, Czechoslovakia

Continuation of Ser. No. 355,839, May 17, 1989, abandoned, which is a continuation of Ser. No. 118,506, Nov. 9, 1987, abandoned. This application Apr. 6, 1990, Ser. No. 507,087

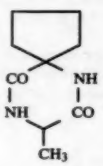
Claims priority, application Czechoslovakia, Nov. 7, 1986, PV 8061-86

The portion of the term of this patent subsequent to Aug. 26, 2008, has been disclaimed.

Int. Cl.[5] A61K *31/495*

U.S. Cl. 514—255 **1 Claim**

1. A method for preventing or treating a peptic ulcer in a warm-blooded animal, which comprises administering to said animal an effective amount of a physiologically active component, cyclo-(1-alanyl-1-amino-1-cyclopentanecarbonyl) of formula I:



I

and an inert non-toxic pharmaceutically acceptable carrier.

5,182,286

PESTICIDAL SUBSTITUTED 2-(6-(PYRIMIDINYL)-INDOL-1-YL)-ACRYLIC ESTERS

Thomas Seitz, Monheim; Alexander Klausener, Krefeld; Dieter Berg, Wuppertal; Ulrike Wachendorff-Neumann, Monheim; Christoph Erdelen, Leichlingen; Gerd Hänssler, Leverkusen; Wilhelm Brandes, Leichlingen, and Stefan Dutzmann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

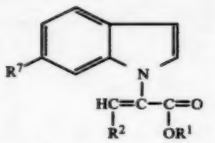
Filed Jan. 18, 1991, Ser. No. 643,390

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1990, 4002466

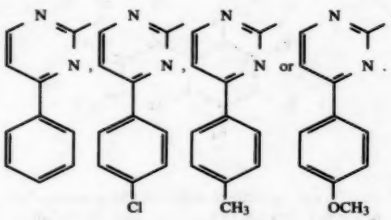
Int. Cl.[5] A61K *31/505;* **C07D** *403/04*

U.S. Cl. 514—256 **8 Claims**

1. A substituted 2-acrylic ester of the formula



in which
R^1 is methyl or ethyl,
R^2 is methoxy or ethoxy,
R^7 is

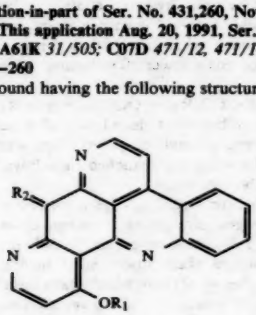


5,182,287
BIOACTIVE HETEROCYCLE ALKALOIDS AND METHODS OF USE

Geewananda P. Gunawardana, Libertyville, Ill.; Peter J. McCarthy, Vero Beach, Fla., and Neal S. Burres, Libertyville, Ill., assignors to Harbor Branch Oceanographic, Fort Pierce, Fla.

Continuation-in-part of Ser. No. 431,260, Nov. 3, 1989, abandoned. This application Aug. 20, 1991, Ser. No. 747,560
Int. Cl.[5] A61K *31/505;* **C07D** *471/12, 471/14, 471/16*
U.S. Cl. 514—260 **14 Claims**

1. A compound having the following structure:



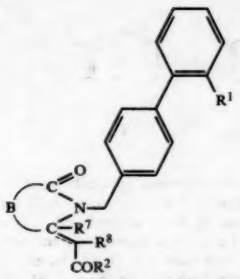
wherein R_1=H, alkyl, alkenyl, aryl, benzyl, acyl, benzoyl, or alkali metal; R_2=O, S, NOX, or NNHX, wherein X is alkyl or aryl.

5,182,288
SUBSTITUTED N-BIPHENYLYL LACTAMS

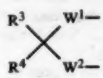
William V. Murray, Belle Mead, and Michael P. Wachter, Bloomsbury, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Nov. 13, 1991, Ser. No. 791,939
Int. Cl.[5] C07D *211/40, 227/087*
U.S. Cl. 514—278 **10 Claims**

1. A compound of the following formula



wherein B is a bisfused radical of the following formula



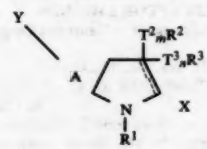
W^1 is $(CH_2)m$;
m is 0, 1, 2
W^2 is $(CH_2)n$;
n is 0, 1, 2
R^1 is C_{1-4} alkoxycarbonyl or tetrozolo;
R^2 is hydroxy, C_{1-4} alkoxy, $(C_{1-6}$ alkyl)HN, di$(C_{1-6}$ alkyl)N, (HO)HN, (HO)$(C_{1-6}$ alkyl)N, $(C_{1-4}$ alkoxy)$(C_{1-6}$ alkyl)N, phenoxy or substituted phenoxy;
R^3 and R^4 are each independently hydrogen, C_{1-6} alkyl, C_{3-8} cycloalkyl, aryl, or R^3 and R^4 taken together form a C_{3-8} carbocyclic ring;
R^7 is hydrogen or hydroxy;
R^8 is hydrogen;
R^7 and R^8 taken together form a bond;
the bond is a single or a double bond; and pharmaceutically acceptable salts thereof; with the proviso that R^7 and R^8 taken together form a bond, R^7 and R^8 are hydrogen or R^7 is hydroxy and R^8 is hydrogen, then the bond is a single bond where R^7 and R^8 are hydrogen or R^7 is hydroxy and R^8 is hydrogen then the bond is a single bond.

5,182,289
HETEROBICYCLIC COMPOUNDS HAVING ANTIINFLAMMATORY ACTIVITY

Pauline C. Ting, Morristown; Margaret H. Sherlock, Bloomfield; Wing C. Tom, Cedar Grove, and James J. Kaminski, Long Valley, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

PCT No. PCT/US89/02502, § 371 Date Dec. 10, 1990, § 102(e) Date Dec. 10, 1990
Continuation-in-part of Ser. No. 206,550, Jun. 14, 1988. This PCT application Jun. 12, 1989, Ser. No. 623,710
Int. Cl.[5] A61K *31/435;* **C07D** *471/04*
U.S. Cl. 514—278 **20 Claims**

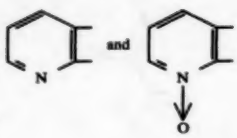
1. A compound of formula



(I)

or a pharmaceutically acceptable salt or solvate thereof, wherein

A is selected from



the dotted lines represent optional double bonds, such that when the bond to X is a double bond, X is O or S; and when the bond to X is a single bond, X is —OR^{10} wherein R^{10} is alkyl or aralkyl wherein one and only one of the pair of dotted lines must be a double bond;

T^2 and T^3 independently represent S, SO or SO_2;

m and n independently represent 0 or 1;

R^1 represents hydrogen, alkyl, aryl, aralkyl, or a 5- or 6-membered heterocyclic aromatic ring having from 1 to 3 heteroatoms in the ring, each heteroatom independently selected from NR^6, O, S or N atoms wherein R^6 is hydrogen or C_1 to C_4 alkyl;

R^2 and R^3 independently represent

hydrogen with the proviso at least one of R^2 and R^3 is not hydrogen; alkyl; cycloalkyl; halogen; haloalkyl; hydroxyalkyl; alkoxyalkyl; aryl; aralkyl; —COR^7 wherein R^7 is alkyl, aryl or aralkyl;

and with the further proviso that when T^2_m or T^3_n is S, SO or SO_2 that R^2 or R^3 is not hydrogen or halogen;

—D—OCO—R^4 wherein D represents an alkylene group having from 1 to 4 carbon atoms and R^4 is alkyl, aryl or aralkyl;

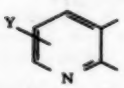
a C_3 to C_7 spirocarbocyclic ring whereby R^2 and R^3 are joined together;

the rings represented by A, R^1, aryl or aralkyl may each be optionally substituted by up to three Y substituents;

wherein each Y substituent independently represents —OH, hydroxyalkyl, alkyl, halogen, —NO_2, alkoxy, alkoxyalkyl, —CF_3, —CN, cycloalkyl, alkynyloxy, alkenyloxy, —$S(O)_p$—R^4 (wherein R^4 is defined above and p is an integer from 0 to 2), —CO—R^5 (wherein R^5 represents —OH, —NH_2, —NHR^4, $N(R^4)_2$ or —OR^4 in which R^4 is as defined above), —O—D—COR^5 (wherein D is defined above and R^5 is as defined above), —NH_2, —NHR^4, —$N(R^4)_2$ (wherein R^4 is as defined above) or —NHC(O)H with the proviso in formula I that if:

X is oxygen;

A is



Y, if present is alkyl;

at least one of R^2 and R^3 is alkyl or halogen; then

R^1 cannot be hydrogen.

5,182,290

CERTAIN OXAZOLOQUINOLINONES; A NEW CLASS OF GABA BRAIN RECEPTOR LIGANDS

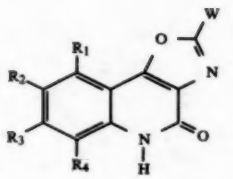
Pamela Albaugh, Clinton, Conn., assignor to Neurogen Corporation, Branford, Conn.

Filed Aug. 27, 1991, Ser. No. 750,464

Int. Cl.[5] C07D 498/04; C61K 31/47

U.S. Cl. 514—293 **22 Claims**

21. A pharmaceutical composition suitable for treatment of conditions in mammals mediated by the use of compounds which selectively bind to GABA receptors comprising a non-toxic pharmaceutically acceptable carrier and a compound of the formula:



wherein:

R_1 and R_4 are the same or different and represent hydrogen, halogen or straight or branched chain lower alkyl having 1–6 carbon atoms;

W is

phenyl, 2- or 3-thienyl, or 2-, 3-, or 4-pyridyl; or

phenyl, 2- or 3-thienyl, or 2-, 3-, or 4-pyridyl each of which is mono or disubstituted with halogen, hydroxy, straight or branched chain lower alkyl having 1–6 carbon atoms, straight or branched chain lower alkoxy having 1–6 carbon atoms, amino, or mono- or dialkylamino where each alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms: and

R_2 and R_3 are the same or different and represent

hydrogen, halogen, hydroxy, straight or branched chain lower alkyl having 1–6 carbon atoms, amino, mono or dialkylamino where each alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms; or

OR_5, COR_5, CO_2R_5, or $OCOR_5$, where R_5 is hydrogen, straight or branched chain lower alkyl having 1–6 carbon atoms, phenyl, or phenylalkyl where the alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms; or

—$CONR_6R_7$ or —$(CH_2)_nNR_6R_7$, where n is 0, 1, or 2, R_6 is hydrogen, straight or branched chain lower alkyl having 1–6 carbon atoms, and R_7 is hydrogen, straight or branched chain lower alkyl having 1–6 carbon atoms, phenyl, or phenylalkyl where the alkyl portion is straight or branched chain lower alkyl having 1-6 carbon atoms; or

—$CONR_6R_7$ or —$(CH_2)_nNR_6R_7$, where n is 0, 1, or 2, and NR_6R_7 forms a heterocyclic group which is morpholyl, piperidyl, pyrrolidyl, or N-alkylpiperizyl where the alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms; or

—$NR_8CO_2R_9$ where R_8 and R_9 are the same or different and represent hydrogen, straight or branched chain lower alkyl having 1–6 carbon atoms, phenyl, or phenylalkyl where the alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms, or

—$C(OH)R_{10}R_{11}$ where R_{10} and R_{11} are the same or different and represent straight or branched chain lower alkyl having 1–6 carbon atoms, phenylalkyl where the alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms.

5,182,291

PYROZALA-PYRIDYL AMINOABKOXYPHENOL COMPOUNDS

Jean Gubin; Pierre Chatelain, both of Brussels; Marcel Descamps, Wavre, all of Belgium; Dino Nisato, Saint Georges D'Orques, France; Henri Inion, Wemmel, Belgium; Jean Lucchetti, Chastre, Belgium; Jean-Marie Mahaux, Brussels, Belgium, and Jean-Noël Vallat, Toulouse, France, assignors to Sanofi, Paris, France

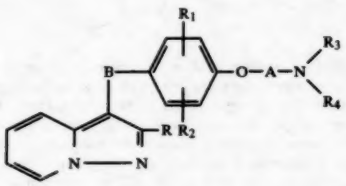
Division of Ser. No. 495,134, Mar. 19, 1990, Pat. No. 5,039,700, which is a division of Ser. No. 82,554, Aug. 7, 1987, Pat. No. 4,957,925, which is a continuation-in-part of Ser. No. 6,233, Jan. 23, 1987, abandoned. This application Jun. 17, 1991, Ser. No. 716,252

Claims priority, application France, Feb. 14, 1986, 86 02045

Int. Cl.[5] C07D *471/04;* A61K *31/40*

U.S. Cl. 514—300 **18 Claims**

1. An aminoalkoxyphenyl compound of formula:



in which:

B is selected from —S—, —SO— and —SO_2—;

R_1 and R_2, which are identical or different, are selected from hydrogen, methyl, ethyl and halogen;

A is selected from a straight- or branched-alkylene radical having from 2 to 5 carbon atoms, a 2-hydroxypropylene radical, and a 2-(lower alkoxy)propylene radical;

R_3 is selected from alkyl having from 1 to 8 carbon atoms and a radical of formula Alk-R_5, in which Alk is selected from a single bond and a linear- or branched-alkylene radical having from 1 to 5 carbon atoms, and R_5 is selected from pyridyl, phenyl, 2,3-methylenedioxyphenyl, 3,4-methylenedioxyphenyl and phenyl substituted with one or more substituents, which may be identical or different, selected from halogen atoms, lower alkyl groups having from 1 to 4 carbon atoms, and lower alkoxy groups having from 1 to 4 carbon atoms;

R_4 is selected from hydrogen and alkyl having from 1 to 8 carbon atoms;

R is selected from hydrogen, C_{1-8}alkyl, C_{3-6}cycloalkyl, benzyl and phenyl optionally substituted with one or more substituents, which may be identical or different, selected from halogen, lower C_{1-4}alkyl, lower C_{1-4}alkoxy and nitro; as well as the N-oxide derivative thereof and a pharmaceutically acceptable salt thereof.

5,182,292

PSYCHOTROPIC PIPERIDINYLMETHYL BENZODIOXANS

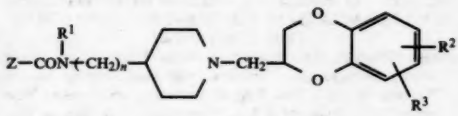
Gary P. Stack, Ambler, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jun. 21, 1991, Ser. No. 719,886

Int. Cl.[5] C07D *405/06;* A61K *31/445*

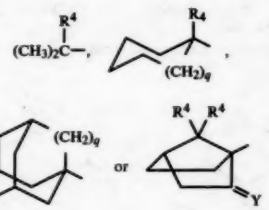
U.S. Cl. 514—321 **5 Claims**

1. A compound of the formula:



in which

Z is



where

R^4 is —H or alkyl of 1 to 4 carbon atoms;

q is one of the integers 0, 1 or 2;

Y is H_2 or O;

R^1 is hydrogen or alkyl of 1 to 4 carbon atoms;

R^2 and R^3 are, independently, hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkanoyloxy of 2 to 6 carbon atoms, hydroxy, halo, amino, mono- or dialkylamino in which each alkyl group has 1 to 4 carbon atoms, alkanamido of 2 to 6 carbon atoms or sulfonamido or R^2 and R^3, taken together are methylenedioxy, ethylenedioxy or propylenedioxy;

n is one of the integers 0 or 1;

or a pharmaceutically acceptable salt thereof.

5,182,293

TREATMENT OF MULTI-DRUG RESISTANT TUMORS WITH PYRIDYLOXAZOLE-2-ONES

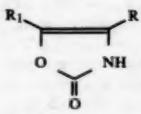
Sai P. Sunkara, and Winton D. Jones, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 436,263, Nov. 13, 1989, abandoned. This application Oct. 3, 1990, Ser. No. 590,524

Int. Cl.[5] A61K *31/44*

U.S. Cl. 514—340 **1 Claim**

1. A method of reversing vinblastine resistance in a patient having a vinblastine resistant tumor which comprises administering to said patient as effective amount of a compound of the formula:



(I)

wherein

R is C_{1-6} alkyl; and

R_1 is 2-, 3- or 4-pyridyl group; or a pharmaceutically acceptable salt thereof.

5,182,294

IMIDAZOLYL PROPYL GUANIDINE DERIVATIVE AND A PHARMACEUTICAL COMPOSITION CONTAINING THIS COMPOUND

Peter Mörsdorf, Langenzenn; Heidrun Engler, Cadolzburg; Helmut Schickaneder, Eckental, and Kurt-Henning Ahrens, Nuremberg, all of Fed. Rep. of Germany, assignors to Heumann Pharma GmbH & Co., Nuremberg, Fed. Rep. of Germany

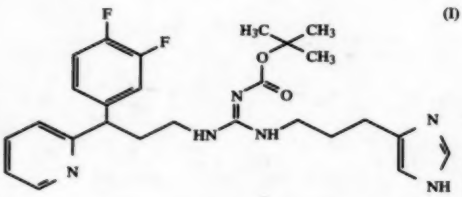
Filed Jan. 10, 1991, Ser. No. 639,511

Claims priority, application European Pat. Off., Jan. 15, 1990, 90/100726.0

Int. Cl.[5] A61K *31/44*; C07D *401/12*

U.S. Cl. 514—341 **6 Claims**

1. A compound having the formula



(I)

or a physiologically acceptable salt or solvate thereof.

5,182,295

INSECTICIDAL BENZOFURAN DERIVATIVES

Marc Benoit, Roquevaire; Jean-Louis Brayer, Nanteuil le Haudouin; Jean-Pierre Demoute, Neuilly Plaisance; Gilles Mourioux, Gemenos, and Laurent Taliani, Les Pavillons sous Bois, all of France, assignors to Roussel Uclaf, Paris, France

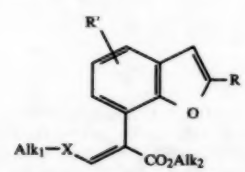
Filed Oct. 1, 1991, Ser. No. 770,986

Claims priority, application France, Oct. 2, 1990, 90 12103

Int. Cl.[5] A61K *31/34, 31/425*; C07D *307/79, 277/24*

U.S. Cl. 514—365 **23 Claims**

1. A compound of the formula



I

wherein R is selected from the group consisting of hydrogen, optionally substituted alkyl, alkenyl and alkynyl of up to 8 carbon atoms, optionally substituted cycloalkyl or cycloalkenyl of up to 8 carbon atoms, optionally substituted aryl of 6 to 18 carbon atoms, optionally substituted benzoyl and optionally substituted optionally substituted benzoyl and optionally substituted heterocycle, the optional aryl, aralkyl, benzoyl and heterocycle substituents being at least one member of the group consisting of halogen, thiazolyl, alkyl and alkoxy of 1 to 6 carbon atoms haloalky, —CN,—NO_2, aldoxycarbonyl-,—$CONH_2$, —OCF_3, optionally substituted alkylamino or dialkylamino of 1 to 4 or carbons, —OR", —SR" in which R" is alkyl or alkenyl of 1 to 6 carbon atoms, or heterocyclo, or said optional substituent is alkylenedioxy, Alk_1 and Alk_2 are individually optionally substituted alkyl of 1 to 8 carbon atoms, X is —O— or —S— and R' is hydrogen or halogen in any position on the phenyl and the geometry of the double bond is E or Z or a mixture of E and Z the optional alkyl, alkenyl, alkynyl, cycloalkyl and cycloalkenyl substituent being at least one halogen.

5,182,296

NAPHTHYLOXAZOLIDONE DERIVATIVES

Hideo Nakai, Takarazuka; Koichiro Yamada, Saitama; Shumihiro Nomura, Misato; Mamoru Matsumoto, Nara, and Hiroshi Iwata, Osaka, all of Japan, assignors to Tanabe Seiyaky Co., Ltd., Osaka, Japan

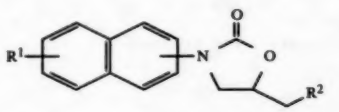
Filed Oct. 18, 1990, Ser. No. 599,564

Claims priority, application Japan, Oct. 26, 1989, 1-279305

Int. Cl.[5] A61K *31/42*

U.S. Cl. 514—376 **6 Claims**

1. A method for treatment or prophylaxis of depressive conditions in a warm-blood animal which comprises administering to said warm-blood animal a pharmaceutically effective amount of a naphthyloxazolidone compound of the formula:



wherein R^1 is a hydrogen atom, a hydroxy group, a nitro group, an amino group, a sulfo group, an aminosulfonyl group, a lower alkenyloxy group, a lower alkynyloxy group, a mono or di(lower alkyl) aminocarbonyloxy group, a lower alkanoyloxy group or a lower alkoxy group which is unsubstituted or has a substituent selected from the group consisting of a phenyl group, a cycloalkyl group of 3 to 6 carbon atoms, a tetrahydrofuryl group, a hydroxy group, a lower alkoxy group, a cyano group, a di(lower alkyl)amino group, an aminocarbonyl group, a lower alkoxycarbonyl group, a lower alkanoyloxy group, a lower alkylthio group, a lower alkylsulfinyl group and a lower alkylsulfonyl group; and R^2 is a lower alkoxy group; or a pharmaceutically acceptable salt thereof.

5,182,297

INHIBITORS OF LYSYL OXIDASE

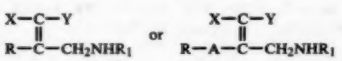
Michael G. Palfreyman; Philippe Bey, both of Cincinnati, and Ian A. McDonald, Loveland, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 519,084, May 4, 1990, Pat. No. 5,021,456, which is a division of Ser. No. 409,195, Sep. 19, 1989, Pat. No. 4,943,593, which is a division of Ser. No. 160,364, Feb. 25, 1988, abandoned. This application Mar. 6, 1991, Ser. No. 665,502

Int. Cl.[5] A61K *31/38, 31/135, 31/13*

U.S. Cl. 514—438 **5 Claims**

1. A method of treating diseases and conditions associated with the abnormal deposition of collagen in a patient in need thereof which comprises administering to the patient a therapeutically effective amount for treating said disease of a compound of the formula

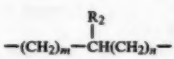


wherein

X and Y are identical and are each either a fluoro, chloro, or bromo group or one of X and Y is a hydrogen and the other is a fluoro, chloro, or bromo group;

R_1 is a hydrogen or a (C_1–C_4)alkyl group;

A is a divalent radical group selected from



wherein

R_2 is hydrogen, methyl, or ethyl, and m and n, independently, are an integer from 0 to 16, provided that m+n cannot be greater than 17;

$-(CH_2)_p-D-(CH_2)_q-$

wherein

D is oxygen or sulfur, p is an integer of from 0 to 16, and q is an integer of from 1 to 16, provided that m+n cannot be greater than 17; and

$-(CH_2)_r-CH=CH-(CH_2)_s-$

wherein

s is an integer of from 1 to 16 and r is an integer of from 0 to 16, provided that r+s cannot be greater than 16; and

R is 2- or 3-thienyl

or a pharmaceutically acceptable salt thereof.

5,182,298

CHOLESTEROL LOWERING AGENTS

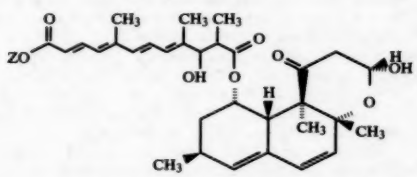
Gregory L. Helms, Fanwood; Wendy S. Horn, Westfield; E. Tracy T. Jones, Edison, and David L. Linemeyer, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 18, 1991, Ser. No. 670,640

Int. Cl.[5] A61K *31/35*; C07D *311/92*

U.S. Cl. 514—455 **13 Claims**

1. A compound of structure (I):



wherein Z is selected from the group consisting of:

a) H;

b) C_{1-5} alkyl;

c) C_{1-5} alkyl substituted with a member of the group consisting of

i) phenyl,

ii) phenyl substituted with methyl, methoxy, halogen (Cl, Br, I, F) or hydroxy; or

a pharmaceutically acceptable salt of a compound of formula (I).

5,182,299

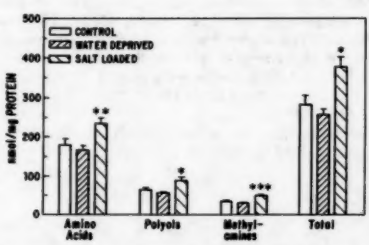
TREATMENT OF OSMOTIC DISTURBANCE WITH ORGANIC OSMOLYTES

Steven R. Gullans, Natick, and Charles W. Heilig, Needham, both of Mass., assignors to Brigham and Women's Hospital, Boston, Mass.

Continuation-in-part of Ser. No. 495,575, Mar. 19, 1990, abandoned. This application Mar. 19, 1991, Ser. No. 670,779

Int. Cl.[5] A61K *31/35, 31/34, 31/70*

U.S. Cl. 514—460 **14 Claims**



1. A method of treating osmotic disturbance in an animal, which comprises administering enterally or parentally to said animal an effective amount of an organic osmolyte, wherein the organic osmolyte is a polyol.

5,182,300

FUROSEMIDE SALTS

Renato L. Pellegata, Milan, Italy, assignor to Roussel Uclaf, Paris, France

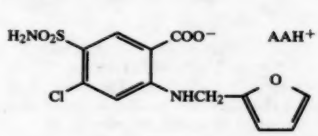
Filed Oct. 23, 1990, Ser. No. 602,008

Claims priority, application Italy, Oct. 24, 1989, 22118 A/89

Int. Cl.[5] A61K *31/34*; C07D *307/38*

U.S. Cl. 514—471 **26 Claims**

1. A compound of the formula



(I)

wherein AA is a basic amino acid in optically active or racemic form.

5,182,301

DIPHENYLETHYLENE DERIVATIVES PHARMACEUTICAL COMPOSITIONS CONTAINING SAME AND TREATMENT METHODS

Youji Yamagishi, Kamiinayoshi; Kozo Akasaka; Takeshi Suzuki, both of Ushiku; Mitsuaki Miyamoto, Niihari; Kouji Nakamoto, Tsuchiura; Kazuo Okano, Yatabemachi; Shinya Abe; Hironori Ikuta, both of Ushiku; Kenji Hayashi; Hiroyuki Yoshimura, both of Yatabemachi; Tohru Fujimori, Toyosato; Koukichi Harada, Yatabemachi, and Isao Yamatsu, Ushiku, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

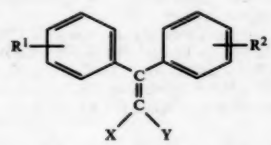
Division of Ser. No. 364,711, Jun. 9, 1989, Pat. No. 5,034,418, which is a division of Ser. No. 24,737, Mar. 11, 1987, Pat. No. 4,886,834. This application Feb. 21, 1991, Ser. No. 659,518

Claims priority, application Japan, Mar. 17, 1986, 61-57061; Mar. 26, 1986, 61-65963

Int. Cl.[5] A61K *31/215*; C07C *69/616*

U.S. Cl. 514—539 **7 Claims**

1. A diphenylethylene derivative having the formula



wherein

each of R^1 and R^2 is hydrogen, hydroxy or lower alkoxy;

X is COR^6, wherein R^6 is amino; and

Y is

(1) $-R^{10}-COOR^3$, wherein R^3 is hydrogen or lower alkyl and R^{10} is a straight chain or branched alkylene having 1 to 3 carbon atoms group

or pharmacologically acceptable salt thereof.

5,182,302
METHOD FOR ENHANCING GROWTH OF MAMMARY PARENCHYMA USING A PROSTAGLANDIN

Robert J. Collier, University City, and Michael F. McGrath, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 92,009, Sep. 2, 1987, Pat. No. 5,059,586, which is a continuation-in-part of Ser. No. 837,477, Mar. 7, 1986, abandoned. This application Jun. 28, 1991, Ser. No. 723,021

Int. Cl.[5] A61K *31/19, 31/557*

U.S. Cl. 514—573 **12 Claims**

1. A method for enhancing the proliferation of mammary parenchymal cells in a mammary gland of a female mammal wherein a proliferation enhancing amount of a mitogenic agent comprising a prostaglandin having a direct mitogenic effect on mammary epithelial cells in said mammal is administered to the mammary gland by intramammary infusion during gestation or between the onset of puberty and the mammal's first gestation.

5,182,303
SUBSTITUTED SEMICARBAZONE ARTHROPODICIDES

John P. Daub; George P. Lahm, both of Wilmington, Del., and Bradford S. Marlin, Cochranville, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

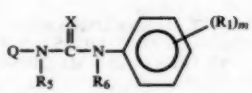
PCT No. PCT/US89/05597, § 371 Date May 20, 1991, § 102(e) Date May 20, 1991

Continuation-in-part of Ser. No. 436,361, Nov. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 290,404, Dec. 27, 1988, abandoned. This PCT application Dec. 20, 1989, Ser. No. 689,042

Int. Cl.[5] A01N *47/34, 47/30;* **C07C** *281/12, 337/08*

U.S. Cl. 514—583 **13 Claims**

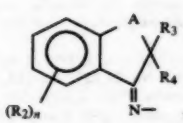
1. A compound of the formula



I

wherein:

Q is



Q-1

A is $(CH_2)_t$, wherein, each carbon individually can be substituted with 1 to 2 substituents selected from 1 to 2 halogen, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 halocycloalkyl, C_4–C_7 alkylcycloalkyl, C_2–C_4 alkoxycarbonyl, or phenyl optionally substituted with 1 to 3 substituent independently selected from W;

R_1 and R_2 are independently R_8, halogen, CN, NO_2, N_3, SCN, OR_8, SR_8, SOR_8, SO_2R_8, NR_8R_9, $C(O)R_8$, CO_2R_8, $C(O)NR_8R_9$, $OC(O)R_8$, OCO_2R_8, $OC(O)NR_8R_9$, $NR_9C(O)R_8$, $NR_9C(O)NR_8R_9$, OSO_2R_8, $NR_9SO_2R_8$; R_2 being other than CH_3 when R_1, R_3 and R_4 are H and A is CH_2;

R_3 is H, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_4–C_6 alkylcycloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_2–C_6 haloalkynyl, C_2–C_6 alkoxyalkyl, C_2–C_6 cyanoalkyl, C_3–C_8 alkoxycarbonylalkyl, OR_8, $S(O)_qR^8$, NR_8R^9, CN, CO_2R_8, $C(O)R_8$, $C(O)NR_8R_9$, $C(S)NR_9R^9$, $C(S)R_8$, $C(S)SR_8$, phenyl optionally substituted with $(R_{10})_p$ or benzyl optionally substituted with 1 to 3 substituents independently selected from W or R_3 is C_3–C_6 cycloalkyl optionally substituted with 1 to 2 halogens or 1 to 2 CH_3;

R_4 is H, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_2–C_6 haloalkynyl, C_2–C_6 alkoxyalkyl, C_2–C_6 cyanoalkyl, phenyl optionally substituted with $(R_{10})_p$ or benzyl optionally substituted with 1 to 3 substituents independently selected from W;

R_5 and R_6 are independently H, C_1–C_{22} alkyl, C_2–C_{22} alkoxyalkyl, C_2–C_{22} alkylcarbonyl, C_2–C_{22} alkoxycarbonyl, C_2–C_{22} haloalkyl carbonyl, C_2–C_{22} haloalkoxycarbonyl, SR_{11}, CHO, C_1–C_4 alkylsulfonyl, phenylsulfonyl optionally substituted with 1 to 3 substituents independently selected from W; C_7–C_{15} phenoxycarbonyl optionally substituted with 1 to 3 substituents selected from W; C_7–C_{15} phenylcarbonyl optionally substituted with 1 to 3 substituents independently selected from W; $C(O)CO_2C_1$ to C_4 alkyl, C_8–C_{12} benzyloxycarbonyl optionally substituted with 1 to 3 substituents independently selected from W; or R_5 and R_6 are independently phenyl optionally substituted with 1 to 3 substituents independently selected from W, or benzyl optionally substituted with 1 to 3 substituents independently selected from W;

R_8 is H, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_4–C_7 cycloalkylalkyl, C_4–C_7 halocycloalkylalkyl C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_2–C_6 alkynyl, C_2–C_6 haloalkynyl, C_2–C_6 alkoxyalkyl, C_2–C_6 alkylthioalkyl, C_1–C_6 nitroalkyl, C_2–C_6 cyanoalkyl, C_3–C_8 alkoxycarbonylalkyl, C_3–C_6 cycloalkyl, C_3–C_6 halocycloalkyl, phenyl optionally substituted with 1 to 3 substituents independently selected from W or benzyl optionally substituted with 1 to 3 substituents independently selected from W;

R_9 is H, C_1–C_4 alkyl, C_2–C_4 alkenyl or C_2–C_4 alkynyl;

R_{10} is R_8, halogen, CN, NO_2, N_3, SCN, OR_8, SR_8, SOR_8, SO_2R_8, NR_8R_9, COR_8, CO_2R_8, $CONR_8R_9$, $SO_2NR_8R_9$, $OC(O)R_8$, OCO_2R_8, $OC(O)NR_8R_9$, $NR_9C(O)R_8$, $NR_9C(O)NR_8R_9$, OSO_2R_8 or $NR_9SO_2R_8$;

R_{11} is C_1–C_{22} alkyl, C_1–C_{22} haloalkyl, phenyl optionally substituted with 1 to 3 substituents independently selected from W;

W is halogen, CN, NO_2, C_1–C_2 alkyl, C_1–C_2 haloalkyl, C_1–C_2 alkoxy, C_1–C_2 haloalkoxy, C_1–C_2 alkylthio, C_1–C_2 haloalkylthio, C_1–C_2 alkylsulfonyl or C_1–C_2 haloalkylsulfonyl;

m is 1 to 5;

n is 1 to 4;

t is 0 to 3; when t is 2 and R_2, R_3, R_4, R_5 and R_6 are each H, then R_1 is other than H or NO_2;

q is 0 to 2;

p is 1 to 3; and

X is O or S; X being O when A is CH_2 and R_2, R_3 and R_4 are H, with the further proviso that when X is S and A is CH_2, the 2,3-dihydro-indene moiety may not be substituted solely with a single methyl group.

5,182,304
N-LOWER ALKYL NEODECANAMIDE INSECT REPELLENTS

Robert J. Steltenkamp, Somerset, N.J., assignor to Colgate-Palmolive Co., New York, N.Y.

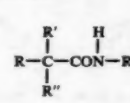
Continuation of Ser. No. 267,141, Nov. 4, 1988, Pat. No. 5,006,562, which is a continuation-in-part of Ser. No. 894,985, Aug. 8, 1986, abandoned, and Ser. No. 71,305, Jul. 16, 1987, Pat. No. 4,804,683. This application Nov. 13, 1990, Ser. No. 612,747

The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

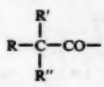
Int. Cl.[5] A01N *37/18*

U.S. Cl. 514—625 **9 Claims**

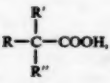
1. Insect repellent compounds which are liquid at room temperature and of the formula



wherein R, R′ and R″ are alkyls and the sum of the carbon atoms therein is eight, and wherein R‴ is methyl, ethyl or a mixture thereof, and wherein the acyl moiety,



of such formula, is a mixture of acyls of corresponding acids of the formula



wherein in about 31% of the neodecanoic acid R is hexyl and R′ and R″ are both methyl, in about 67% of the neodecanoic acid R′ is methyl, R″ is alkyl of a carbon atoms content greater than that of methyl and less than that of R, and R is of a carbon atoms content less than that of hexyl, and in about 2% of the neodecanoic acid R′ and R″ are both of a carbon atoms content greater than that of methyl and less than that of R, and R is of a carbon atoms content less than that of hexyl.

5,182,305

N-ARYL AND N-CYCLOAKYL NEOALKANAMIDE INSECT REPELLENTS

Robert J. Steltenkamp, Somerset, N.J., assignor to Colgate-Palmolive Co., New York, N.Y.

Continuation-in-part of Ser. No. 612,747, Nov. 12, 1990, and a continuation-in-part of Ser. No. 267,141, Nov. 4, 1988, Pat. No. 5,006,562, and a continuation-in-part of Ser. No. 609,290, Nov. 5, 1990, and a continuation-in-part of Ser. No. 264,936, Oct. 31, 1988, Pat. No. 5,015,665, and a continuation-in-part of Ser. No. 894,985, Aug. 8, 1986, abandoned. This application Feb. 19, 1991, Ser. No. 657,707

Int. Cl.[5] A01N *37/18*

U.S. Cl. 514—629 **14 Claims**

1. A process for repelling insects from an area, location or item which comprises applying to or near such an area, location or item an insect repelling quantity of an insect repellent N-monosubstituted amide which is an substituted or unsubstituted aryl or cycloalkyl neoalkanamide in which the total number of carbon atoms is in the range of 11 to 14 and is in the range of 12 to 14 when the neoalkanoyl moiety is pivaloyl, and the substituent on the nitrogen of the amide is aryl or cycloalkyl moiety of at least 5 carbon atoms in which the aryl is unsubstituted in the ortho positions thereof.

5,182,306

USE OF COLCHICINE FOR THE CONTROL OF RETROVIRUSES

William W. Hall, New York, N.Y.; Stanley E. Read, Toronto, Canada; Michael Lyons, Irvington, and John B. Zabriskie, New York, both of N.Y., assignors to The Rockefeller University, New York, N.Y.

Continuation of Ser. No. 412,638, Sep. 25, 1989, abandoned, which is a continuation of Ser. No. 208,752, Jun. 17, 1988, abandoned. This application Aug. 12, 1991, Ser. No. 746,283

Int. Cl.[5] H61K *31/16*

U.S. Cl. 514—629 **2 Claims**

1. A method of treating a human patient infected by a retrovirus of the lentivirous group which comprises administering to said human a therapeutically effective amount of colchicine.

5,182,307

POLYETHYLENE TEREPHTHALATE FOAMS WITH INTEGRAL CRYSTALLINE SKINS

Vipin Kumar, Seattle, Wash., assignor to Board of Regents of the University of Washington, Seattle, Wash.

Continuation-in-part of Ser. No. 829,896, Feb. 3, 1992, which is a continuation-in-part of Ser. No. 615,708, Nov. 21, 1990, abandoned. This application Apr. 21, 1992, Ser. No. 872,082

Int. Cl.[5] C08J *9/34*

U.S. Cl. 521—51 **6 Claims**

1. An article of polyethylene terephthalate comprising:

polyethylene terephthalate foam; and

an integral layer of crystallized polyethylene terephthalate having a weight percent crystallinity of at least about 19 percent.

5,182,308

PRODUCTION OF FOAM SHEETS OF HIGH COMPRESSIVE STRENGTH

Heinz Voelker, Limburgerhof; Gerhard Alicke, Worms; Horst Schuch, Ilvesheim; Manfred Weilbacher, Frankenthal, and Reinhold Weber, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 1, 1991, Ser. No. 724,057

Claims priority, application Japan, Jul. 4, 1990, 4021273

Int. Cl.[5] C08J *9/08, 9/14*

U.S. Cl. 521—79 **10 Claims**

1. A process for the production of foam sheets of high compressive strength and a cross-sectional area of at least 50 cm^2 which comprises extruding a mixture of a styrene polymer, from 5 to 16% by weight, based on the styrene polymer, of a blowing agent, wherein the blowing agent used is a mixture containing

a) from 3 to 70% by weight of an alcohol or ketone having a boiling point of from 56° to 100° C.,

b) from 5 to 50% by weight of carbon dioxide and

c) from 0 to 90% by weight of a saturated C_3- to C_5-hydrocarbon and/or of a hydrogen-containing chlorofluorocarbon or fluorinated hydrocarbon boiling at from −30° to +30° C.

5,182,309

POLYURETHANE FOAM MATERIAL FREE OF HALOGENATED HYDROCARBONS AND PROCESS FOR PRODUCING THE SAME

Hans W. Hützen, Greefsallee 51, D-4060 Viersen 1, Fed. Rep. of Germany

PCT No. PCT/EP90/00581, § 371 Date Dec. 21, 1990, § 102(e) Date Dec. 21, 1990, PCT Pub. No. WO90/12841, PCT Pub. Date Nov. 1, 1990

PCT Filed Apr. 12, 1990, Ser. No. 635,152

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1989, 3913473; Oct. 9, 1989, 3933705; Oct. 31, 1989, 3936227; Feb. 8, 1990, 4003718

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—99 **28 Claims**

1. Polyurethane insulating foam material comprising a catalyst, a pore stabilizing agent and/or a flame retardant, wherein the pores are free from halogenated hydrocarbons and contain minor amounts of a foaming agent used in the production of the foam material and selected from the group consisting of a lower alkane containing 3 to 6 carbon atoms and the mixtures of several of such lower alkanes, said foaming agent having a boiling point at normal pressure between −10° and +70° C., and wherein said flame retardant is selected from the group consisting of the liquid and the solid flame retardants, said flame retardant or flame retardants being present in the foam material in an amount of 5 to 35 percent by weight based upon the total weight of the final foam material.

5,182,310
ISOCYANATE-REACTIVE COMPOSITION AND PROCESS FOR PREPARING A FLEXIBLE POLYURETHANE FOAM

Richard G. Skorpenske, and Alan K. Schrock, both of Lake Jackson, Tex., assignors to Dow Chemical Company, Midland, Mich.

Filed Jul. 25, 1991, Ser. No. 736,270
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—116 **18 Claims**

1. An isocyanate-reactive composition comprising an isocyanate-reactive compound having an equivalent weight of from about 400 to about 5,000, and a hindered phenolic antioxidant having a molecular weight greater than about 700 in an amount sufficient to reduce scorch up to about 50 percent when compared to a similar isocyanate-reactive composition having an equal number of equivalents of 2,6-di-tert-butyl-4-methylphenol.

5,182,311
BLOWING AGENT-CONTAINING POLYMERIC MDI COMPOSITIONS

Jimmy L. Patterson, New Boston, and Robert E. Riley, Flat Rock, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Filed Mar. 27, 1992, Ser. No. 858,787
Int. Cl.[5] C08J *9/14*
U.S. Cl. 521—131 **1 Claim**

1. In a process for the preparation of a polyurethane or polyisocyanurate foam wherein a polyol component and an isocyanate component are reacted in the presence of a blowing agent, with an isocyanate index of from 70 to about 900, the improvement comprising

a) selecting monochlorodifluoromethane as at least one portion of said blowing agent, and

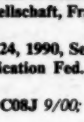
b) dissolving at least a portion of said monochlorodifluoromethane into an isocyanate component comprising in major portion a medium viscosity polymeric methylenediphenylenediisocyanate having a viscosity between 400 centipoise and 1200 centipoise when measured at 25° C., prior to reaction of said isocyanate component with said polyol component.

5,182,312
HYDROPHILIC, SWELLABLE POLYMERS

Friedrich Engelhardt, Frankfurt am Main, and Gerlinde Ebert, Dreieich/Offenthal, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 24, 1990, Ser. No. 589,808
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1989, 3933351
Int. Cl.[5] C08J *9/00*; C08F *38/00*
U.S. Cl. 521—149 **6 Claims**

1. Hydrophilic, swellable polymer which consists in random distribution, to the extent of 98 to 100% by weight of radicals of the general formula I



(I)

wherein

R^1 denotes hydrogen, methyl or ethyl,

R^2 denotes carboxyl, or carboxyl which is esterified by alkanol having 1 to 4 carbon atoms; and

R^3 denotes hydrogen, methyl, ethyl or carboxyl, it also being possible for acid groups to be present in salt form, and to the extent of 0–2% by weight of radicals of a crosslinking agent which having originated from monomers having at lest two olefinically unsaturated double bonds, characterized in that it is in the form of a highly porous, foam-like polyhedral structure.

5,182,313
METHOD AND APPARATUS FOR FORMING ARTICLES MADE OF POLYURETHANE

Scott Carson, 22 Monte Vista Dr., Woodland, Calif. 95695

Filed Jan. 9, 1992, Ser. No. 819,103
Int. Cl.[5] C08G *18/14*
U.S. Cl. 521—155 **28 Claims**

1. An apparatus for manufacturing articles made of polyurethane having a polyol weight tank, an isocyanate weight tank and an additive tank each in communication with a mix tank for mixing chemicals from said tanks, said polyol weigh tank, said isocyanate weigh tank and said additive tank being enclosed by a vent chamber, said apparatus further having a containment vessel for enclosing a mold for forming such polyurethane article.

5,182,314
FLEXIBLE POLYURETHANE FOAMS AND PROCESS FOR PRODUCING SAME

Kensuke Tani, and Yoshiaki Tonomura, both of Yokohama, Japan, assignors to 501 Nippon Polyurethane Industry Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1990, Ser. No. 589,320
Claims priority, application Japan, Nov. 30, 1989, 1-312189
Int. Cl.[5] C08G *18/70*; C08J *9/08*
U.S. Cl. 521—160 **22 Claims**

1. A low density, flexible polyurethane foam produced from the reaction of an active-hydrogen-containing component with an organic polyisocyanate compound, wherein the active-hydrogen-containing component comprises an active hydrogen compound, an additive, and a blowing agent, the only blowing agent being carbon dioxide which is generated by the reaction of water with free isocyante groups, and wherein the organic polyisocyanate compound is a mixture of diphenylmethane diisocyanate and polyphenylmethane polyisocyanate in a ratio of not more than about 1.0 mole of diphenylmethane diisocyanate per mole of polyphenylmethane polyisocyanate, wherein the diphenylmethane diisocyanate comprises

(a) from about 20% by weight to about 50% by weight of a mixture of 2,2′- and 2,4′-isomers, and

(b) from about 80% by weight to about 50% by weight of 4,4′-isomer,

the isocyanate mixture containing not more than about 60% by weight of the 4,4′-isomer of diphenylmethane diisocyanate, and the polyphenylmethane polyisocyanate having an average functionality of not less than about 2.9 and containing less than about 35% by weight of diphenylmethane diisocyanate.

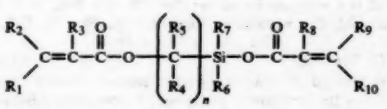
5,182,315
PHOTOCURABLE SILICONE GEL COMPOSITION, AND METHOD OF MAKING THE SAME

Hsien-Kun Chu, Wethersfield; Robert P. Cross, West Simsbury, and David I. Crossan, Hebron, all of Conn., assignors to Loctite Corporation, Hartford, Conn.

Filed Nov. 19, 1990, Ser. No. 615,186
Int. Cl.[5] C08F *2/50*; C08G *77/16, 77/18, 77/20*
U.S. Cl. 522—37 **36 Claims**

1. A silicone composition, comprising:

(a) a first silane of the formula:

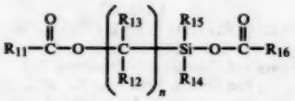


wherein:

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, and R_{10} are independently selected from hydrogen, halo, and organo radicals; and

n is an integer having a value of from 1 to 4;

(b) a second silane of the formula:



wherein:

R_{11} and R_{16} are non-polymerizable groups and are independently selected from halo and organo radicals;

R_{12}, R_{13}, R_{14}, and R_{15} are independently selected from hydrogen, halo, and organo radicals; and

n is an integer having a value of from 1 to 4; and

(c) a polysiloxane having at least two functional groups per molecule with which said first and second silanes are cappingly and non-hydrolyzingly reactive;

wherein: (1) the first and second silanes together are provided in sufficient quantity relative to said polysilxane to non-hydrolyzingly react with substantially all of the cappingly reactive functional groups of the polysiloxane, and (2) the first silane constitutes from about 50% to about 98% by weight of the total weight of the first and second silanes.

5,182,316

FLUORESCENT DEGREE OF CURE MONITORS

Robert J. DeVoe, St. Paul; Katherine A. Brown-Wensley, Lake Elmo, and George V. D. Tiers, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 709,719, Jun. 3, 1991, Pat. No. 5,118,559. This application Nov. 26, 1991, Ser. No. 798,582

Int. Cl.[5] C08F *12/32, 265/04, 212/32;* **C08G** *77/04*

U.S. Cl. 522—99 **17 Claims**

1. A method for measuring the degree of cure of a polymeric composition comprising the steps of:

a) reacting a mixture comprising a polymerizable composition comprising at least one of 1) a hydride curable silicone, 2) an ethyleneically unsaturated compound, 3) a cationically sensitive compound, and a spectroscopically detectable amount of a latent uvaphore comprising at least one of dibenzofulvene or derivative thereof, to provide an at least partially polymerized composition comprising a uvaphore, which differs chemically from said latent uvaphore, that absorbs radiant energy of a wavelength range centered around λ_1 and emits radiant energy of a wavelength range centered around λ_2, λ_1 and λ_2 each being a wavelength within the ultraviolet portion of the electromagnetic spectrum; and the mean of the range of λ_1 being below the mean of the range of λ_2; and

b) measuring uvescence intensity at a wavelength centered around λ_2 emitted by said composition during or after polymerization to provide an indication of degree of cure.

5,182,317

MULTIFUNCTIONAL THROMBO-RESISTANT COATINGS AND METHODS OF MANUFACTURE

Suzanne Winters, Salt Lake City; Kenneth A. Solen, Orem; Clifton G. Sanders, Salt Lake City; J. D. Mortensen, Sandy, and Gaylord Berry, Salt Lake City, all of Utah, assignors to Cardiopulmonics, Inc., Salt Lake City, Utah

Division of Ser. No. 215,014, Jul. 5, 1988, which is a continuation-in-part of Ser. No. 204,115, Jun. 8, 1988, Pat. No. 4,850,958. This application Jun. 17, 1991, Ser. No. 716,843

Int. Cl.[5] A01N *1/00*

U.S. Cl. 523—112 **30 Claims**

1. A method for producing a multifunctional thrombo-resistant coating for use on surfaces which contact blood, the method comprising the steps of:

(a) obtained by application of one plasma etching or plasma polymerization a material having a siloxane surface onto which a plurality of amine functional groups have been bonded;

(b) reacting the amine functional groups on the siloxane surface with poly(ethylene oxide) chains terminated with functional groups capable of reacting with the amine functional groups on the siloxane surface, thereby resulting in a product having single poly(ethylene oxide) chains which are bonded to corresponding single amine functional groups;

(c) reacting the product of step (b) with a plurality of at least two different bioactive molecules capable of counteracting specific blood-material incompatibility reactions such that a single bioactive molecule is correspondingly coupled to a single poly(ethylene oxide) chain, thereby resulting in a siloxane surface to which are attached, by a poly(ethylene oxide) chain, a plurality of at least two different bioactive molecules which react with blood components which come in proximity to the siloxane surface of the material in order to resist blood-material incompatibility reactions.

5,182,318

COATING COMPOSITION CONTAINING METAL-COATED MICROSPHERES EXHIBITING IMPROVED RESISTANCE TO ENVIRONMENTAL ATTACK OF METALLIC SUBSTRATES

Ronald R. Savin, 10448 Chester Rd., Cincinnati, Ohio 45215

Filed Jan. 10, 1991, Ser. No. 639,782

Int. Cl.[5] C08K *7/28, 3/08;* **C08L** *63/02*

U.S. Cl. 523—216 **13 Claims**

1. A coating composition for the protection of metallic substrates against environmental attack comprising, in weight percent based on the total weight of the composition:

from about 10% to about 30% of at least one film-forming polymer comprising epoxy resins having an epoxide value of about 250 to about 2500;

from about 40% to about 55% particulate metallic zinc;

from about 4.75% to about 7% zinc-coated hollow glass microspheres having diameters ranging from about 2.5 to about 60 microns, the volumetric ratio of said particulate zinc to said microspheres ranging from about 0.8:1 to 1.2:1;

from about 1.5% to about 3% of least one particle size grade of a pyrogenic amorphous silica having an average particle size ranging from about 0.007 to about 0.004 micron, and

not more than 30% solvents compatible with said at least one film-forming polymer.

5,182,319

PRESSURE SENSITIVE BITUMINOUS COMPOSITIONS

Grant D. Mitchell, Joplin, Mo., assignor to Tamko Asphalt Products, Inc., Joplin, Mo.

Filed Sep. 27, 1991, Ser. No. 767,082

Int. Cl.[5] C08L *53/00, 53/02*

U.S. Cl. 524—68 **23 Claims**

1. A pressure sensitive bituminous composition having improved adhesiveness and tack comprising:

a) from about 50% to about 87% by weight of a bituminous component having a penetration rate between about 250 and about 450 (0.1 mm) at 25° C. and a total aromatic content from about 45% to about 75% by weight of the bituminous component;

b) from about 1% to about 15% by weight of a first block copolymer M_1 of the A-B-A type in which the two A blocks are the same or different thermoplastic non-elastomeric polymer blocks prepared by polymerization of one or more monoalkenyl aromatics and in which the

polymer block B is an elastomeric polymer block prepared either by polymerization of one or more conjugated alkadienes with one or more monovinyl aromatics;

c) from about 1% to about 10% by weight of a second block copolymer M_2 of the A-B type in which block A represents a thermoplastic polymer block prepared by polymerization of one or more alkenyl aromatics and block B represents an elastomeric polymer block prepared either by polymerization of one or more conjugated alkadienes or by copolymerization of one or more conjugated alkadienes with one or more monovinyl aromatics, such that the percentage of said first block copolymer M_1 and said second block copolymer M_2 in combination is at least about 3%; and

d) from about 5% to about 50% by weight of a fumed silica.

5,182,320

MATERIAL FOR LIGHT-HEAT ENERGY ACCUMLATION AND CONVERSION

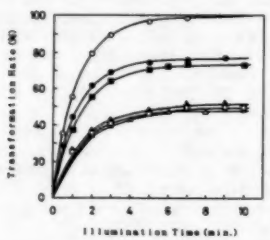
Tadaomi Nishikubo, Tokyo, Japan, assignor to Research Development Corporation of Japan, Chiyoda, Japan

Filed Apr. 1, 1991, Ser. No. 678,433

Claims priority, application Japan, Mar. 31, 1990, 2-85793; Mar. 31, 1990, 2-85794; May 29, 1990, 2-138875

Int. Cl.[5] C08K *5/34;* **C08F** *8/00, 136/00*

U.S. Cl. 524—88 **4 Claims**



1. A material for light-heat energy accumulation and conversion comprising a composition in solid form of a polymer having a norbonadien derivative group as a side chain, capable of converting into the corresponding quadrycyclan derivative group in the presence of light, and a cobalt complex catalyst compound capable of converting the quadrycyclan derivative group back to the original norbonadien derivative group, said catalyst being present in an amount sufficient to accomplish this conversion.

5,182,321

PIPERAZINE CYANURATE AND POLYMER COMPOSITIONS COMPRISING IT

Guido Bertelli, Ferrara; Osvaldo Cicchetti, Milan; Paolo Goberti, and Renato Locatelli, both of Ferrara, all of Italy, assignors to HIMONT Incorporated, Wilmington, Del.

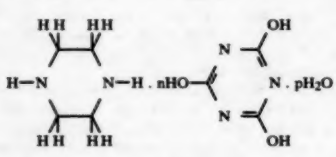
Filed Dec. 18, 1991, Ser. No. 809,811

Claims priority, application Italy, Dec. 20, 1990, 22454 A/90

Int. Cl.[5] C08K *5/3492;* **C07D** *403/02*

U.S. Cl. 524—100 **6 Claims**

1. A piperazine cyanurate having the formula:



wherein n is from 1 to 2 and p is from 0 to 3.

5,182,322

CHLORINATED ETHYLENE COPOLYMER LATEX

James W. Dawes, Geneva, Switzerland, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 5, 1990, Ser. No. 622,268

Int. Cl.[5] C08K *5/11;* **C08L** *31/04*

U.S. Cl. 524—308 **11 Claims**

1. A stable binder latex substantially free from organic solvents useful for preparing coating composition for application to a substrate which comprises 100 parts by weight of a chlorinated ethylene vinyl acetate copolymer resin containing up to 16% by weight vinyl acetate, wherein the ethylene/vinyl acetate copolymer resin, prior to chlorination, has a melt flow index of at least 1500 g/10 minutes, 6–14 parts by weight per hundred parts chlorinated ethylene vinyl acetate copolymer resin of a nonionic surfactant selected from the group consisting of alkyl or aryl esters of polyoxyethylene, alkyl and/or aryl esters of polyoxyethylene-polyoxypropylene adducts, alkylphenoxy polyoxyethylenes, or alkylphenoxy polyoxypropylene-polyoxyethylene adducts or mixtures thereof that coat microscopic particles of the chlorinated ethylene vinyl acetate copolymer resins thereby preventing the particles from coalescing, and water.

5,182,323

WATER DISPERSIBLE PRESSURE SENSITIVE HOT MELTS

Gary S. Russell, Hampshire, England, assignor to ISP Investments Inc., Wilmington, Del.

Filed May 28, 1991, Ser. No. 705,979

Int. Cl.[5] C08F *220/02*

U.S. Cl. 52[illegible] **7 Claims**

1. A hot melt composition which is water soluble or water dispersible comprising

3 to 50 wt % of a thermoplastic rubber which is a block copolymer of monomers with one and two olefinic unsaturations,

10 to 50 wt % of a copolymer of vinyl pyrrolidone and vinyl acetate, and

10 to 50 wt % of monocarboxylic fatty acid having 8 to 22 carbon atoms wherein at least half the fatty acid has a carbon chain length of 10 to 14 carbon atoms.

5,182,324

ALCOHOLIC MARKING INK COMPOSITION

Takahiro Osada, and Yoko Aoki, both of Gunma, Japan, assignors to Mitsubishi Pencil Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1991, Ser. No. 808,438

Claims priority, application Japan, Jan. 11, 1991, 3-012504

Int. Cl.[5] C08K *5/05*

U.S. Cl. 524—379 **6 Claims**

1. An alcoholic marking ink composition which comprises a coloring agent, a solvent mainly composed of ethanol, a condensation product of urea and aliphatic aldehydes as a resin to be added, and a cationic surface active agent.

5,182,325

POLYMER CONTAINING FLUORINATED POLYMER AND BORON COMPOUND

Christianus A. Claesen, Bergen op Zoom; Johannus H. G. M. Lohmeijer, Hoogerheide; Michael P. J. Boogers, Eindhoven; Jan Bussink, Bergen op Zoom; Hermannus B. Savenije, Putte; Theodorus L. Hoeks, Bergen op Zoom, and Johannes C. Gosens, Roosendaal, all of Netherlands, assignors to General Electric Co., Selkirk, N.Y.

Filed Oct. 12, 1989, Ser. No. 420,509

Claims priority, application Netherlands, Oct. 12, 1988, 8802502; Nov. 11, 1988, 8802919; Jun. 5, 1989, 8901415

Int. Cl.[5] C08K *3/38, 5/55*

U.S. Cl. 524—404 10 Claims

1. A polymer composition, which comprises:

a polyphenylene ether polymer wherein at least 20 percent of the polymer comprises an aromatic main chain; and as a flame-retardant ingredient, a mixture consisting essentially of 0.2–15 percent by weight of the fluroine containing polymer selected from the group consisting of polyvinylidene fluoride, polytetrafluoroethylene and copolymers of ethylene and tetrafluoroethylene and 0.05–10 percent by weight of an inorganic boron compound.

5,182,326

ROSIN AND FATTY ACID BASED PIGMENT GRINDING AIDS FOR WATER-BASED INK FORMULATIONS

Paul J. LeBlanc, Jacksonville, Fla., and Peter Schilling, Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Apr. 8, 1991, Ser. No. 681,916

Int. Cl.[5] C08L *77/00*

U.S. Cl. 524—514 10 Claims

1. A grinding base comprising ink pigments dispersed in a solution having a pH between 3 and 10 with a pigment grinding aid, said pigment grinding aid prepared by the steps comprising:

(a) reacting 100 parts be weight of a member selected from the group consisting of an unsaturated fatty acid, a resin acid, and a combination thereof with 5 to 30 parts by weight of a member selected from the group consisting of acrylic acid, methacrylic acid, fumaric acid, maleic anhydride, and a combination thereof, in an "ene"-cyclocondensation reaction to form a polycarboxylic acid anhydride;

(b) reacting 1 to 2.5 parts by weight of said polycarboxylic acid anhydride with 1 part by weight of polyamine to form an amidoamide or imidoamide reaction product; and

(c) reacting 100 parts by weight of said reaction product with 10 to 30 parts by weight of a member selected from the group consisting of acrylic acid and methacrylic acid.

5,182,327

HIGH-GLOSS LATEX PAINTS AND POLYMERS FOR USE THEREIN

John Biale, Anaheim, Calif., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 278,248, Nov. 30, 1988, abandoned. This application Dec. 17, 1990, Ser. No. 628,712

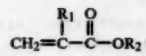
Int. Cl.[5] C08L *31/02, 31/04*

U.S. Cl. 524—556 18 Claims

18. A binder comprising water and solids, wherein about 1 to about 30 weight percent of the solid content of the binder is a polymer comprising:

(a) about 3 to about 20 weight percent olefinic carboxylic acid; and

(b) at least about 43 weight percent acrylic monomer having the formula



wherein R_1 is selected from the group consisting of hydrogen and methyl and R_2 is an alkyl group comprising up to 6 carbon atoms, the polymer having a weight average molecular weight of about 15,000 to about 150,000.

5,182,328

RF CURABLE TYPE I WOOD ADHESIVE COMPOSITION COMPRISING VINYL ACETATE/NMA COPOLYMER EMULSIONS CONTAINING TETRAMETHYLOL GLYCOLURIL

John G. Iacoveillo, Allentown, and David W. Horwat, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 4, 1992, Ser. No. 846,307

Int. Cl.[5] C08L *33/24*

U.S. Cl. 524—803 20 Claims

1. In an aqueous vinyl acetate/N-methylolacrylamide copolymer emulsion for RF curable Type I wood adhesive compositions, the improvement which comprises a copolymer emulsion prepared by the aqueous emulsion polymerization of the vinyl acetate and N-methylolacrylamide in the presence of 1 to 5 wt % tetramethylol glycoluril and a stabilizing system consisting essentially of 3 to 5 wt % polyvinyl alcohol, wt % based upon vinyl acetate monomer.

5,182,329

PROCESS FOR PRODUCING CARRIERS FOR IMMUNOASSAY

Norio Hagi, Yamato, and Takahiro Takeyama, Yokohama, both of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Mar. 13, 1991, Ser. No. 668,782

Claims priority, application Japan, Mar. 13, 1990, 2-59906; Apr. 5, 1990, 2-89238

Int. Cl.[5] C08F *2/00*

U.S. Cl. 525—242 15 Claims

1. A process for producing carriers for an immunoassay, comprising the steps of:

(1) cutting a polystyrene material into pellets,

(2) polymerizing the polystyrene pellets and a monomer required for forming polystyrene in the presence of a polymerization initiator and a crosslinking agent in a medium in which the pellets and the monomer are hardly soluble, to obtain spherical polystyrene beads, and

(3) roughening the surface of the spherical polystyrene beads.

5,182,330

PROCESS FOR THE COPOLYMERIZATION OF 4-METHYL-1-PENTENE

Phil M. Stricklen; Daniel M. Hasenberg, and Patrick Rooney, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 13, 1991, Ser. No. 745,021

Int. Cl.[5] C08F *255/00*

U.S. Cl. 525—247 1 Claim

1. In a batch particle form polymerization of 4-methyl-1-pentene and at least one other alpha-olefin in a polymerization liquid diluent consisting essentially of 4-methyl-1-pentene, the improvement comprising

(1) charging 4-methyl-1-pentene, catalyst, and cocatalyst to the polymerization vessel, wherein said catalyst consists essentially of titanium trichloride and said cocatalyst consists essentially of a dialkylaluminum halide,

(2) carrying out homopolymerization of 4-methyl-1-pentene to form 4-methyl-1-pentene homopolymer in an amount sufficient to reduce the solubility of the later formed co-

polymer in the polymerization liquid diluent during polymerization,

(3) adding comonomer to the polymerization vessel while polymerization continues,

(4) and continuing polymerization to form said copolymer, said polymerizations being conducted at a temperature of at least about 50° C. and the amount of homopolymer formed in (2) being no greater than about 5 wt. percent of the end product copolymer.

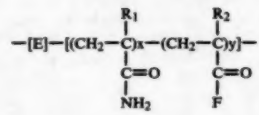
5,182,331

WATER SOLUBLE BLOCK COPOLYMERS AND METHODS OF USE THEREOF

Wen P. Liao, Warminster; Fu Chen, Newtown, and Stephen R. Vasconcellos, Doylestown, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Feb. 26, 1991, Ser. No. 661,580
Int. Cl.[5] C08F 293/00; C02F 11/12
U.S. Cl. 525—294 8 Claims

1. A water soluble block copolymer comprising the formula:



wherein E is a polymer obtained from the polymerization of ethylenically unsaturated hydrophobic monomers initiated by a difunctional initiator; R_1 and R_2 are H or a C_1 to C_3 alkyl group; F is a salt of an ammonium cation selected from the group consisting of $NHR_3N^+(R_{4,5,6})M^-$ and $OR_3N^+(R_{4,5,6})M^-$; wherein R_3 is a C_1 to C_4 linear or branched alkylene group; R_4, R_5 and R_6 and H, C_1 to C_4 linear or branched alkyl, C_5 to C_8 cycloalkyl, aromatic or alkylaromatic; M^- is an anion selected from the group consisting of chloride, bromide, methyl sulfate and hydrogen sulfate; and the molar percentage of x:y is from about 0:100 to 95:5, with the proviso that the total of x+y equals 100%.

5,182,332

DENTAL COMPOSITION

Naoki Yamamoto; Nobuhiro Mukai; Hitoshi Ige, and Junko Atarashi, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1990, Ser. No. 561,178
Claims priority, application Japan, Aug. 2, 1989, 1-199487
Int. Cl.[5] A61K 6/083; C08L 51/04; C08F 285/00
U.S. Cl. 525—305 4 Claims

1. A dental composition comprising a (meth)-acrylic ester compound as the principal component, wherein the (meth)acrylic ester compound contains at least one polyfunctional (meth)acrylic ester compound, and containing a polymerization initiator, which is characterized by having incorporated therein a grafted rubber obtained by polymerizing at least one ethylenically unsaturated monomer in the presence of a multilayer composite rubber obtained by polymerizing at least an acrylate monomer in the presence of a latex selected from the group consisting of styrene resins and polybutadiene and wherein the multilayer rubber contains 60 to 90 parts by weight of acrylate rubber and wherein the grafted rubber is present in an amount of 0.01 to 10 parts by weight per 100 parts by weight of the (meth)-acrylic ester compound.

5,182,333

PRODUCTION OF RUBBERY ISOOLEFIN POLYMERS

Kenneth W. Powers, Berkeley Heights; Hsien-Chang Wang, Edison; Debra C. Handy, Basking Ridge, and James V. Fusco, Red Bank, all of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 611,209, Nov. 9, 1990, abandoned, which is a division of Ser. No. 131,938, Dec. 11, 1987, Pat. No. 5,071,913. This application Nov. 12, 1991, Ser. No. 791,764
Int. Cl.[5] C08F 279/02
U.S. Cl. 525—315 19 Claims

1. A process for producing a composition of matter comprising a C_4 to C_7 isoolefin homopolymer rubber, butyl copolymer rubber, or mixtures thereof, wherein the molecular weight distribution of said rubber or said mixture is such that the ratio of the moment of said molecular weight distribution, Mz/Mw, is equal to 2.0 to about 11.0 and that portion of said molecular weight distribution which is equal to or greater than 4 times the peak molecular weight, Mp comprises from about 8 to about 25 weight percent of the total polymer species, Mp is about 250,00 to about 850,000 and wherein said polymer species of molecular weight less than Mp are substantially branch free, said process comprising the step of polymerizing a C_4 to C_7 isoolefin, or a mixture of a C_4 to C_7 isoolefin and a C_4 to C_{14} conjugated diene, and incorporating an effective amount of a cationically functional reagent during said polymerizing step, at conditions such that substantially all of said cationically functional reagent is grafted to said polymer.

5,182,334

COMPATIBLE LCP BLENDS VIA DIRECT ESTERIFICATION

Paul Chen, Sr., Gillett; Vincent Sullivan, Madison; Thomas Dolce, Stirling, and Mike Jaffe, Maplewood, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Apr. 3, 1991, Ser. No. 679,894
Int. Cl.[5] C08L 67/02, 71/12
U.S. Cl. 525—397 12 Claims

1. A process for making a compatible liquid crystal polymer blend comprising the steps of:

(a) combining a liquid crystal polymer having a carboxylic acid or an ester end group, a second polymer, boric acid, and a strong acid chosen from the group consisting of polyphosphoric acid, sulfuric acid, and mixtures thereof; and,

(b) melt mixing said combined polymers and acids at a temperature sufficient to cause said polymers to flow, said mixing promoting a direct esterification reaction between said liquid crystal polymer and said second polymer,

wherein said second polymer comprises a polymer chosen from the group consisting of:

a polyphenyleneoxide having a hydroxyl end group or end-capped with an ester linkage that will cleave during said combining or mixing steps; and

a polyphenylenesulfide having a thiol group or end-capped with a thioester group that will cleave during said combining or mixing steps.

5,182,335

COMPOSITE MATERIAL FOR THE MOULDING OF FIBRE-REINFORCED UNSATURATED POLYESTER RESIN

Mario Da Re', Turin, Italy, assignor to Fiat Auto SpA, Turin, Italy

Continuation of Ser. No. 252,073, Sep. 30, 1988, abandoned. This application Dec. 4, 1990, Ser. No. 625,624
Claims priority, application Italy, Sep. 30, 1987, 67829 A/87
Int. Cl.[5] C08L 67/06
U.S. Cl. 525—30 2 Claims

1. A composite moulding material with a fiber-reinforced unsaturated polyester resin base which comprises a thermoplastic copolyester-ether elastomer derived from terephthalic

acid, polytetramethylene ether glycol and 1,4-butanediol and melamine resin in the unsaturated polyester resin base, wherein the melamine resin is present in an amount of from 5 to 20% by weight with respect to the composite material and the thermoplastic copolyester-ether elastomer is present in an amount of from 5 to 10% by weight with respect to the composite material.

5,182,336

THERMOPLASTIC RESIN COMPOSITION

Hiroomi Abe; Kenji Nagaoka; Taichi Nishio; Hideo Shinonaga, and Takashi Sanada, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 7, 1990, Ser. No. 624,304
Claims priority, application Japan, Dec. 27, 1989, 1-341454
Int. Cl.[5] C08L 71/12, 77/00
U.S. Cl. 525—132 14 Claims

1. A thermoplastic resin composition which comprises:

(i) at least one compatibilizing agent in an amount effective for compatibilization,

(ii) (A) a polyphenylene ether in an amount of about 40–100% by weight based on the total amount of (A) and (B) and

(B) a homopolymer of alkenyl aromatic compound or a random copolymer of alkenyl aromatic compound and unsaturated compound in an amount of about 60% by weight or less based on the total amount of (A) and (B), the total amount of (A) and (B) being about 10% by weight or more based on total amount of all polymer components,

(iii) at least one polyamide in an amount more than the amount required for forming a continuous phase, and

(iv) lactam or derivative thereof having a molecular weight of 2,000 or less and having ring opening or condensation polymerizability or reactivity with acid or amine, in an amount of 0.05–2% by weight based on the total amount of the components (i), (ii) and (iii).

5,182,337

POWDER COATING COMPOSITION COMPRISING A CO-REACTABLE PARTICULATE MIXTURE OF CARBOXYLIC ACID GROUP-CONTAINING POLYMERS AND BETA-HYDROXYALKYLAMIDE CURING AGENT

Paul H. Pettit, Jr., Allison Park; Debra L. Singer, and Marvin L. Kaufman, both of Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 503,002, Apr. 2, 1990, abandoned, which is a division of Ser. No. 408,420, Sep. 18, 1989, Pat. No. 4,937,288, which is a continuation of Ser. No. 139,488, Dec. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 912,463, Sep. 29, 1986, Pat. No. 4,727,111. This application Oct. 16, 1991, Ser. No. 777,455
Int. Cl.[5] C08L 67/02
U.S. Cl. 525—176 8 Claims

1. A thermosetting powder coating composition comprising a co-reactable particulate mixture of:

(a) 35 to 85 percent by weight of the entire composition based on weight of resin solids of a first carboxylic acid group-containing acrylic polymer having a Tg in the range of about 35° C. to 100° C.;

(b) from about 1 to 25 percent by weight of the entire composition based on weight of resin solids of a carboxylic acid group-containing polyester having a number average molecular weight from about 300 to about 1500 and an acid equivalent weight of from about 150 to about 750, said polyester being crystalline at temperatures under 50° C., for assisting flow of the powder coating composition;

(c) a beta-hydroxyalkylamide curing agent, the equivalent ratio of beta-hydroxyalkylamide equivalents to carboxylic acid equivalents being within the range of about 0.6 to 1.6:1; and

(d) an amorphous acid group-containing polymer comprising a carboxylic acid group-containing polyester.

5,182,338

POLYMER BLEND COMPOSITIONS

Satish K. Gaggar, Parkersburg, W. Va., assignor to General Electric Company, New York, N.Y.

Continuation of Ser. No. 437,711, Nov. 17, 1989, abandoned. This application Nov. 22, 1991, Ser. No. 796,930
Int. Cl.[5] C08L 23/12, 23/02, 71/03
U.S. Cl. 525—187 2 Claims

1. A polymer blend composition, comprising 5 to 20 weight percent of an antistatic agent and 80 to 95 weight percent of a polyolefin polymer, said antistatic agent comprising a copolymer of epihalohydrin and alkylene oxide in a weight ratio of from about 15:85 to about 40:60.

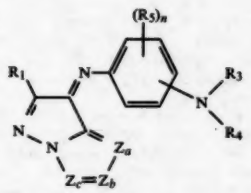
5,182,339

PYRAZOLOAZOLEAZOMETHINE DYES

Shigeki Yokoyama; Tadahisa Sato; Keizo Kimura; Nobuo Furutachi, and Osamu Takahashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 475,069, Feb. 5, 1990, Pat. No. 5,026,867, which is a division of Ser. No. 130,489, Dec. 9, 1987, Pat. No. 4,921,968. This application Dec. 5, 1990, Ser. No. 622,466
Claims priority, application Japan, Dec. 9, 1986, 61-292751
Int. Cl.[5] C07D 487/04; C08F 265/02, 265/04
U.S. Cl. 525—242 12 Claims

1. A polymer comprising a pyrazoloazoleazomethine dye of formula (I):



(I)

wherein, R_1 represents a substituent having a Hammett's substituent constant value of at least 0.6; Z_a, Z_b and Z_c each represents

wherein R_2 represents a hydrogen atom or a substituent, or =N—; when Z_c=Z_b is a carbon-carbon double bond, it may form a part of an aromatic ring; R_3, R_4, and R_5 each represents a hydrogen atom or a substituent; and n represents 1 or 2; and wherein said dye is combined with the polymer through a divalent or higher valent group at R_1, Z_a, Z_b or Z_c wherein said polymer is a copolymer comprising ethylenically unsaturated monomers.

5,182,340

BLENDS OF MESOGENIC POLYTHIIRANES, EPOXY RESIN AND CURING AGENT

Robert E. Hefner, Jr., and Jimmy D. Earls, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 9, 1990, Ser. No. 594,243
Int. Cl.[5] C08L 63/02, 63/04
U.S. Cl. 525—525 7 Claims

1. A curable composition comprising

(I) a blend comprising

(A) at least one thiirane resin containing an average of

more than one thiirane group and at least one rodlike mesogenic moiety per molecule;

(B) an epoxy resin containing an average of more than one vicinal epoxide group per molecule; and

(II) a curing amount of a curing agent.

5,182,341

OLEFIN POLYMERIZATION METHOD

Albert P. Masino, 5934 Oak Grove Ct., Hamilton, Ohio 45011

Division of Ser. No. 516,754, Apr. 30, 1990, Pat. No. 5,126,302. This application May 14, 1992, Ser. No. 882,674

Int. Cl.[5] C08F *4/44*

U.S. Cl. 526—125 **24 Claims**

1. A method of polymerizing one or more polymerizable 1-olefins, said method comprising the step of polymerizing said 1-olefin or 1-olefins under polymerizing conditions in the presence of a catalyst system comprising an alkylaluminum cocatalyst and a solid catalyst component prepared by a method comprising the steps of:

(a) contacting particulate, porous silica of the formula $SiO_2 \cdot aAl_2O_3$ where a is in the range of 0 to about 2 with a hydrocarbon-soluble organomagnesium compound selected from the group consisting of hydrocarbon-soluble dialkyl magnesium compounds, alkoxymagnesium halides, dialkoxymagnesium compounds, and alkylalkoxymagnesium compounds in the presence of an inert liquid hydrocarbon to produce a solid product;

(b) contacting the solid product of step (a) with a magnesium fixing agent comprising $SiCl_4$ at a temperature less than about 70° C.;

(c) contacting the solid product of step (b) with a C_1–C_8 alkanol in a molar ratio of alkanol to magnesium in the range of about 1 to about 5, inclusive;

(d) contacting the solid product of step (c) with $TiCl_4$; and,

(e) contacting the solid product of step (d) with a carboxylic acid derivative selected from the group consisting of alkyl, aryl, and cycloalkyl carboxylic acid dichlorides, anhydrides and diesters; or,

(d') contacting the solid product of step (c) with a carboxylic acid derivative selected from the group consisting of alkyl, aryl, and cycloalkyl carboxylic acid dichlorides, anhydrides and diesters; and,

(e') contacting the solid product of step (d') with $TiCl_4$; or,

(d'') contacting the solid product of step (c) with $TiCl_4$ and a carboxylic acid derivative selected from the group consisting of alkyl, aryl, and cycloalkyl carboxylic acid dichlorides, anhydrides and diesters;

(f) subsequently subjecting the solid product of step (e), step (e') or step (d'') to extraction with an extraction liquid comprising $TiCl_4$ at a temperature of greater than about 100° C. for about 1 to 3 hours to produce a solid product; and,

(g) isolating said solid product of step (f).

5,182,342

HYDROFLUOROCARBON SOLVENTS FOR FLUOROMONOMER POLYMERIZATION

Andrew E. Feiring; Carl G. Krespan; Paul R. Resnick; Bruce E. Smart, all of Wilmington, Del.; Theodore A. Treat, Washington, W. Va., and Robert C. Wheland, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1992, Ser. No. 843,754

Int. Cl.[5] C08F *2/00*

U.S. Cl. 526—206 **25 Claims**

1. A polymerization process, comprising, contacting a fluoromonomer, a free radical source capable of initiating polymerization of said fluoromonomer, and a solvent wherein the solvent:

is a saturated organic compound or a saturated organic compound containing one carbon-carbon double bond;

contains only carbon, fluorine, and at least one hydrogen atom, or contains only carbon, fluorine, at least one hydrogen atom and one or more ether oxygen atoms or one or more alcohols or one or more ether oxygen atoms and one or more alcohols;

contains at least as many fluorine atoms as hydrogen atoms;

contains no more than two adjacent $-CH_2-$ groups; and

has no hydrogen atoms on any primary carbon or has hydrogen atoms on primary carbon only in $-CF_2OCH_3$ groups;

provided that:

when water is less than about 20 volume percent of the polymerization medium, said polymerization process is carried out at a temperature below about 100° C.;

if the solvent contains said carbon-carbon double bond, the solvent shall not be polymerizable under process conditions;

said solvent shall have a boiling point at atmospheric pressure of about 0° C. to about 150° C.;

if adjacent $-CH_2-$ groups are present, any carbon atoms alpha to each of the $-CH_2-$ groups has no hydrogen bound to it.

5,182,343

HOMOPOLYMERS OF SULFONATED ISOPRENE AND 1,3-BUTADIENE AND AGENTS CONTAINING THE SAME

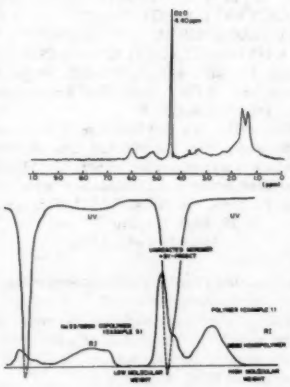
Hisao Ono, Yokkaichi; Katsumi Ito, Suzuka; Tatuo Uekawa, Yokkaichi, and Katsuhiro Ishikawa, Chiba, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 7,333,027, Apr. 4, 1989, abandoned. This application Dec. 26, 1990, Ser. No. 632,631

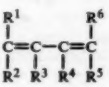
Claims priority, application Japan, Apr. 15, 1988, 63-91286

Int. Cl.[5] C08F *28/02*

U.S. Cl. 526—240 **7 Claims**



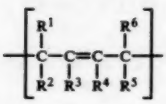
1. A water-soluble polymer having at least one of the recurring structural units represented by the formulas (III), (IV) and (V) obtained by subjecting a monomer represented by the formula (I) to polymerization:



(I)

-continued

(III)



(IV)

(V)

wherein R^1, R^2, R^3, R^5, and R^6, which be the same or different, represent hydrogen atoms or an $—SO_3X$ group (X represents a hydrogen atom, a metal atom, an ammonium group or a quaternary ammonium group); wherein one of said R^1, R^2, R^3, R^5 and R^6 is an $—SO_3X$ group; and wherein R^4 is a hydrogen atom or a methyl group, wherein said water-soluble polymer has a poly(sodium styrenesulfonate)-reduced weight average molecular weight of 500 to 5,000,000.

5,182,344

CURING POLYESTER OR POLYCARBONATE AND POLYEPOXIDE WITH POLYORGANO PHOSPHOROUS CATALYST

Theodore L. Parker, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 405,992, Sep. 11, 1989, Pat. No. 5,037,903. This application Apr. 23, 1991, Ser. No. 690,147

Int. Cl.[5] C08L *63/02, 63/04, 67/02, 69/00*

U.S. Cl. 525—438 **38 Claims**

1. The method of making a latently thermosettable, thermoplastic resin mass which includes the following steps:

A. selecting a composition which comprises

(a) an aromatic polyester essentially free of active hydrogens,

(b) a compatible polyepoxide essentially free of active hydrogens, and

(c) a catalytically effective amount of a catalyst for the reaction of ester groups in said polyester with oxiranes in said polyepoxide;:

the number ratio of said oxiranes to said ester groups being within the range of from about 0.8/1 to about 2.25/1,

and said catalyst being a polyorgano, pentavalent phosphorous salt which, when

(1) said polyester is a polycarbonate prepared from bisphenol A and phosgene and has a weight average molecular weight of about 24,000,

(2) said polyepoxide is the diglycidylether of bisphenol A,

(3) the polycarbonate to polyepoxide ratio by weight is 42.5/57.5 and the amount of said catalyst is 0.015 mmoles per gram of the total weight of polycarbonate and polyepoxide, and

(4) the polycarbonate, polyepoxide and catalyst are mixed together and the Secant Onset Temperature of the resultant mixture determined,

results in said Temperature being within the range extending from above 125° C. to the highest temperature at which said composition can be melt-processed without deteriorating or prematurely setting up, and

B. converting a body of said composition, by melt-processing it at or above a first temperature, to a shaped mass which is partially cured to an extent such that if it is cooled as necessary until it solidifies and then reheated, it can be further melt-processed at a temperature higher than said first temperature.

5,182,345

BLENDS OF COPOLY(ARYLENE SULFIDE) AND POLCARBONATE

Shriram Bagrodia; David R. Fagerburg; Joseph J. Watkins, and Paul B. Lawrence, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 12, 1991, Ser. No. 729,249

Int. Cl.[5] C08F *283/02*

U.S. Cl. 525—462 **5 Claims**

1. A composition comprising an admixture of

(A) from 99 to 1 weight percent, based on the weight of the admixture, of a copoly(arylene sulfide) corresponding to the structure $[(—A—S—)_{1-x}(—A—S—S—)_x]_n$

wherein A is a divalent substituted or unsubstituted aromatic radical, x is in the range of 0.5 to 0.001 and n is at least 25, and

(B) from 1 to 99 weight percent, based on the weight of the admixture, of an bisphenol-A polycarbonate having an inherent viscosity of at least 0.3.

5,182,346

ACCELERATORS FOR CURING PHENOLIC RESOLE RESINS

Arthur H. Gerber, Louisville, Ky., assignor to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 562,206, Aug. 2, 1990, Pat. No. 5,096,983. This application Nov. 21, 1990, Ser. No. 616,879

Int. Cl.[5] C08G *8/28;* **C08F** *283/00;* **B22C** *1/00, 1/22*

U.S. Cl. 525—503 **14 Claims**

1. A method for accelerating the hardening of a phenolic resole resin composition at a temperature of about 60° F. to 120° F. which comprises mixing:

A. a hardenable phenolic resole resin having a pH of about 4.5 to 9.5, a solids content of about 50% to 90% by weight of the resin, and a viscosity of about 100 to 4,000 cps at 25° C.;

B. from about 5% to 50% by weight of the resin of a magnesium hardening agent selected from the group consisting of magnesium hydroxide and lightburned magnesium oxide, said magnesium oxide having a surface area of at least about 10 square meters per gram;

C. from about 5% to 40% by weight of the resin of an ester functional hardening agent; and

D. from about 0.5% to 5% by weight of the resin of an accelerator wherein the accelerator is a chelating agent selected from the group consisting of pentane-2,4-dione, heptane-2,4-dione, 2,2'-bipyridine and benzoylacetone.

5,182,347

ACCELERATORS FOR REFRACTORY MAGNESIA

Arthur H. Gerber, Louisville, Ky., assignor to Borden, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 616,879, Nov. 21, 1990, which is a continuation-in-part of Ser. No. 562,206, Aug. 2, 1990, Pat. No. 5,096,983. This application Dec. 9, 1991, Ser. No. 803,979

Int. Cl.[5] C08F *283/00;* **C08L** *61/00, 8/28;* **B22C** *1/22*

U.S. Cl. 525—508 **35 Claims**

1. A method for accelerating the ambient temperature hardening of a mixture of a phenolic resin and magnesia aggregate wherein the mixture has a pH of at least 4.5 which comprises mixing:

A. magnesia aggregate;

B. a curable phenolic resole resin solution having a viscosity of about 100 to 10,000 cps at 25° C., the quantity of said resin being sufficient to bind the aggregate on thermal curing of the resin; and

C. accelerate the ambient temperature hardening of said mixture, said compound selected from the group consisting of: a compound which provides to the mixture acetate, adipate, 1,2,4-benzenetricarboxylate, formate, glycolate, lactate, nitrate, benzenesulfonate, naphthalenesulfonate, methanesulfonate, phenolsulfonate, succinate, sulfamate, or toluenesulfonate anions; and a mixture of said accelerator compounds.

5,182,348

ARYLMETHYLOLS, THEIR PREPARATION AND THEIR USE

Hermann Braeunling, Burghausen; Richard Becker, Emmerting, and Georg Bloechl, Traunreut, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

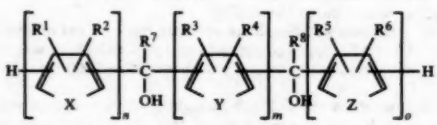
Filed Aug. 19, 1991, Ser. No. 746,932

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1990, 4027253

Int. Cl.[5] C08F *28/06, 26/06;* **C07D** *207/30, 409/06, 233/52, 233/28*

U.S. Cl. 526—256 **8 Claims**

1. A compound of the formula (1)



wherein

R^1, R^2, R^3,

R^4, R^5 and R^6 which may be identical or different radicals on the rings, denote hydrogen atoms, halogen atoms, straight-chain or branched C_1- to C_6- alkyl radicals, C_1- to C_6-alkylcarboxylic acid radicals or esters thereof with C_1- to C_4-alkanols, C_1- to C_6- alkylamino radicals or nitro or cyano groups, wherein at least two of the radicals R^1, R^2, R^3, R^4, R^5, and R^6 can be linked to one another in pairs and form a trimethylene or tetramethylene group;

X, Y and Z denote identical or different divalent radicals —O—, —S—, —N(R^9)— or —C(R^{10})=C(R^{11})—, with the proviso that at least one of the radicals X, Y and Z is not a radical of the formula —C(R^{10})=C(R^{11})—, and wherein

R^9 is a hydrogen atom, a branched or unbranched C_1- to C_8-alkyl radical or a phenyl radical;

R^{10} and R^{11} are, in each case, identical or different radicals which have one of the meanings of R^1;

R^7 and R^8 denote identical or different radicals selected from hydrogen atoms or C_1- to C_6-alkyl or phenyl radicals; and

n, m and o denote identical or different integers with a value of from 1 to 10.

5,182,349

ETHYLENE COPOLYMER AND METHOD OF PRODUCING SAME

Tadao Okada, Yokkaichi; Hajime Ikeno, Yokkaichi; Yuji Ozeki, Yokkaichi; Yoshikazu Higaki, Yokkaichi; Koshi Matsubara, Yokkaichi, and Kenichi Nakamura, Kashima, all of Japan, assignors to Mitsubishi Petrochemical Company, Ltd., Tokyo, Japan

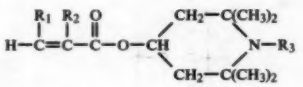
Filed Jul. 15, 1991, Ser. No. 729,686

Claims priority, application Japan, Feb. 8, 1990, 2-203904; Jul. 23, 1990, 2-192970

Int. Cl.[5] C08F *26/06*

U.S. Cl. 526—265 **9 Claims**

1. An ethylene copolymer having improved light stability which consists essentially of ethylene (A) and vinyl compound (B) represented by the following formula:



wherein R_1 and R_2 are each an independent hydrogen atom or a methyl group, R_3 is a hydrogen atom or an alkyl group of 1–4 carbon atoms; a ratio of (B) to the sum of (A) and (B) is less than 1 mol %; a proportion of the amount of vinyl compounds (B), which are not successively bonded at all to like units (B) in the chain, but bonded to unlike units (A) on both sides thereof, to the total amount of (B) units in the copolymer is at least 83%; and an MFR of the copolymer ranges from 0.1 to 200 g/10 min.

5,182,350

OZONE-RESISTANT BUTYL ELASTOMER

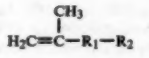
James V. Fusco, Red Bank; Hsien-Chang Wang, Edison, and Kenneth W. Powers, Berkeley Heights, all of N.J., assignors to Exxon Chemical Patents Inc, Linden, N.J.

Continuation of Ser. No. 333,158, Apr. 4, 1989, abandoned. This application Oct. 30, 1990, Ser. No. 605,679

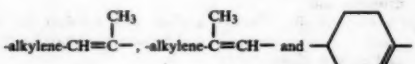
Int. Cl.[5] C08F *236/20*

U.S. Cl. 526—308 **20 Claims**

1. A vulcanizable copolymer of at least one isoolefin and at least one non-conjugated diene of the formula



where R_1 is a member of the group consisting of



and R_2 is a C_1 to C_6 alkyl group, said copolymer containing about 85 to 99.5 weight percent of said at least one isoolefin moiety.

5,182,351

THERMOSETTING RESIN COMPOSITIONS

Toshio Shiobara, and Hisashi Shimizu, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1990, Ser. No. 580,668

Claims priority, application Japan, Sep. 11, 1989, 1-235305

Int. Cl.[5] C08F *30/08*

U.S. Cl. 526—279 **18 Claims**

1. A thermosetting resin composition comprising in admixture,

(a) a maleimide compound having at least one N-substituted maleimide group in the molecule thereof and
(b) a silicon compound having a conjugated double bond.

5,182,352
MOLDING MATERIALS

Toshihiro Yamamoto; Masao Kimura, and Keiichi Saito, all of Kawasaki, Japan, assignors to Nippon Steel Chemical Co., Ltd. and Nippon Steel Corp., Tokyo, Japan

Filed Mar. 30, 1992, Ser. No. 860,007
Claims priority, application Japan, Mar. 29, 1991, 3-089331
Int. Cl.[5] C08F *220/14*
U.S. Cl. 526—329.2 **1 Claim**

1. Molding materials comprising copolymers consisting essentially of 10 to 30% by weight of α-methylstyrene units, 40 to 70% by weight of methyl methacrylate units and 10 to 30% by weight of styrene units with a weight average molecular weight in the range from 50,000 to 200,000, a melt flow rate (MFR) in the range from 4 to 18 g./10 min. at 220° C. under a 10-kg load and a Vicat softening point of 130° C. or more.

5,182,353
METHOD FOR BONDING AN ANALYTE-SENSITIVE DYE COMPOUND TO AN ADDITION-CURE SILICONE

Henry K. Hui, Laguna Niguel; George A. Divers, III, and Carmen Soikowski, both of San Diego, all of Calif., assignors to Puritan-Bennett Corporation, Carlsbad, Calif.

Continuation-in-part of Ser. No. 394,637, Aug. 16, 1989, Pat. No. 5,015,715. This application Jul. 24, 1990, Ser. No. 557,624
The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.
Int. Cl.[5] C08G *77/12*
U.S. Cl. 528—31 **2 Claims**

1. A method for bonding an analyte-sensitive indicator substance selected from the group consisting of perylene, benzoperylene, coronene, and decacyclene to addition-cure silicone to form a sensor element, comprising the steps of:
adding butyllithium and tetramethylethylenediamine to the indicator substance in a tetrahydrofuran/hexamethylphosphoramide solvent system to generate a mixture containing the carbanion of the indicator substance;
adding 8-bromo-1-octene to the indicator substance carbanion mixture to form a functionalized indicator substance;
reacting the functionalized indicator substance with polymethylhydrosiloxane to form an indicator-bound silicone liquid; and
cross-linking the indicator-bound silicone liquid with vinyl-terminated polysiloxane to form said sensor element.

5,182,354
TRANSPARENT, COMPACT POLYURETHANE CASTING COMPOSITIONS THAT ARE STERILIZABLE WITH SUPERHEATED STEAM, PROCESS FOR PREPARING SAME, AND THEIR USE, PARTICULARLY FOR MEDICAL-TECHNICAL ARTICLES

Peter Horn, Heidelberg; Walter Heckmann, Weinheim; Falko Ramsteiner, Ludwigshafen, and Friedrich Gerold, Haar, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 7, 1990, Ser. No. 507,694
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1989, 3912531
The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.
Int. Cl.[5] C08G *18/30*
U.S. Cl. 528—60 **14 Claims**

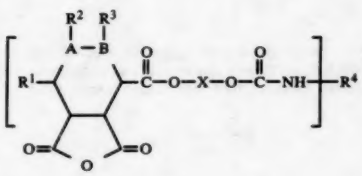
1. A transparent, substantially compact polyurethane casting composition which is sterilizable with superheated steam, wherein the composition is produced by a method comprising the steps of:
A. preparing a modified diphenylmethane diisocyanate wherein liquid at 23° C., the modified diphenylmethane diisocyanate being prepared by a process of reacting a diphenylmethane diisocyanate isomer mixture with at least one polyoxypropylene polyol wherein the diphenylmethane diisocyanate isomer mixture comprises from about 60 to about 90 weight percent of 4,4'diphenylmethane diisocyanate, from about 40 to about 8 weight percent of 2,4' diphenylmethane diisocyanate, and from 0 to 5 weight percent of 2,2'-diphenylmethane diisocyanate, and wherein the polyoxypropylene polyol has a molecular weight of from about 350 to about 800, the polyoxypropylene polyol having been produced by using at least one initiator selected from the group consisting of glycerine and trimethylol propane, and wherein the reaction of the diphenylmethane diisocyanate isomer mixture with the polyoxypropylene polyol is carried out with a ratio of NCO:OH of from about 2.5:1 to about 15:1, whereby the modified diphenylmethane diisocyanate is produced, and
B. reacting the modified diphenylmethane diisocyanate with at least one compound having at least two reactive hydrogen atoms thereon.

5,182,355
POLYURETHANE POLYANHYDRIDE OLIGOMERS AND METHOD OF PREPARATION

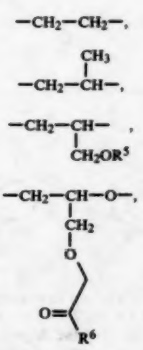
Jonathan T. Martz, Glenshaw; Karl F. Schimmel, Verona; Padmanabhan Sundararaman, Allison Park, and David N. Walters, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 504,814, Apr. 5, 1990, Pat. No. 5,059,655. This application Sep. 30, 1991, Ser. No. 829,706
Int. Cl.[5] C08G *18/34, 18/67;* B05D *1/36, 7/04*
U.S. Cl. 528—75 **15 Claims**

1. A polyurethane polyanhydride oligomer characterized in that it comprises at least one moiety represented by the following structure:



wherein:
X is:



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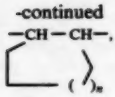
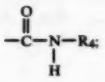


wherein n is 0, 1, 2, 3, or
a fused ring system;
R^1 is hydrogen or an aliphatic radical;
A and B are both CH— in which case R_2 and R_3 are independently hydrogen or an aliphatic radical; or
A and B are connected to form —C=C—
R^4 is the residue of a mono or polyisocyanate;
R^5 is an aliphatic group, aromatic group, alicyclic group or



R^6 is an aliphatic, aromatic or alicyclic group.

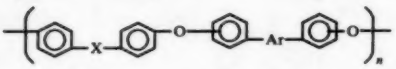
5,182,356

POLY(1,2,4-TRIAZOLE) VIA AROMATIC NUCLEOPHILIC DISPLACEMENT

John W. Connell; Paul M. Hergenrother, both of Yorktown, Va., and Peter Wolf, Frankenthal, Fed. Rep. of Germany, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

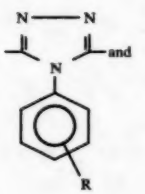
Filed Jan. 24, 1991, Ser. No. 650,336
Int. Cl.[5] C08G *73/08*
U.S. Cl. 528—128 **8 Claims**

1. A poly(1,2,4-triazole) consisting of repeating units having the following general structural formula

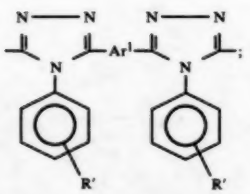


wherein the substitution of oxygen is selected from the group consisting of: meta-meta, para-para, and para-meta; wherein Ar is a radical selected from the group consisting of:

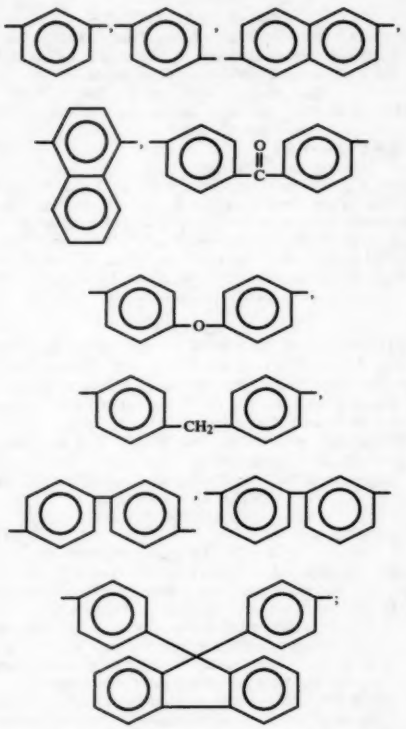
A.



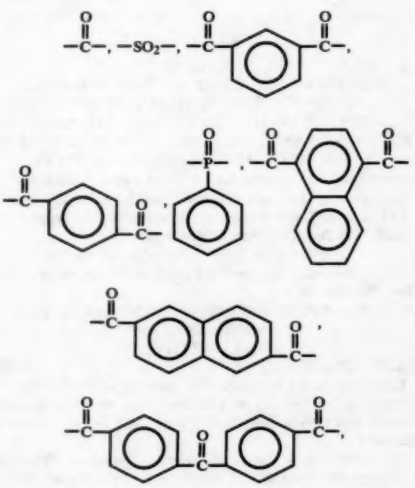
B.



wherein R and R′ are selected from the group consisting of: H, CH_3, CH_2CH_3, CN, OCH_3, F, Cl, Br, I, phenyl, and phenoxy; wherein the substitution of the R group is selected from the group consisting of: meta and para; wherein the substitution of the R′ group is selected from the group consisting of: meta-meta, para-para, and para-meta; wherein Ar′ is selected from the group consisting of:



wherein X is a radical selected from the group consisting of:



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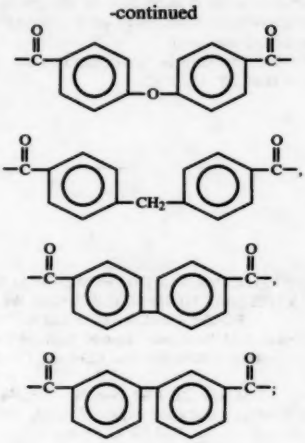


and wherein n is an integer between 4 and 100.

5,182,357

STORAGE STABLE 100% SOLIDS HIGH ORTHO PHENOL FORMALDEHYDE HOT MELT ADHESIVES

Gary L. Linden, Centerville, Ohio, assignor to DAP, Inc., Tipp City, Ohio

Filed Oct. 22, 1991, Ser. No. 780,359
Int. Cl.[5] C08G *8/10*
U.S. Cl. 528—137 **13 Claims**

1. Method of preparing a thermosetting 100 percent solids high-ortho phenol/formaldehyde resin useful as a hot melt adhesive comprising:

(a) forming a reaction mixture comprising molten phenol and non-aqueous formaldehyde reactants present in a molar ratio of 1.2–1.7 moles of said non-aqueous formaldehyde per mole of said molten phenol, said reaction mixture being devoid of added solvent;

(b) adding from about 0.02 to 10 wt. % of an ortho directing catalyst to said reaction mixture based on the weight of said phenol and formaldehyde;

(c) heating said reaction mixture at a temperature of from about 110°–125° C. until substantially no free formaldehyde remains in said reaction mixture and wherein the refractive index approaches about 1.6";

(d) allowing said reaction mixture to cool, thus forming a solid storage stable thermosetting phenol/formaldehyde resin having a molecular weight of between about 500 and 5,000 atomic mass units.

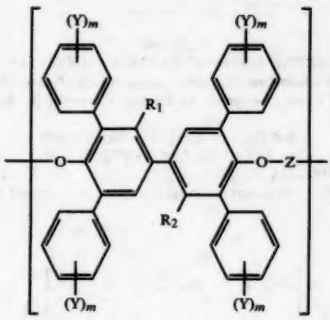
5,182,358

POLYMERS AND COPOLYMERS OF HIGH GLASS TRANSITION TEMPERATURE FROM HINDERED PHENOLS

Allan S. Hay, 5015 Glencairn Ave., Montreal, Quebec, Canada H3W 2B3 , and Whan Gi Kim, 3575 University Avenue, Montreal, Quebec, Canada H3A 2B1

Filed Apr. 11, 1991, Ser. No. 683,860
Int. Cl.[5] C07C *39/12*
U.S. Cl. 528—191 **10 Claims**

1. A homopolymer or copolymer containing units of formula:



(II)

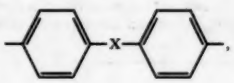
wherein

R_1 and R_2 are the same and are selected from methyl, phenyl, naphthyl, p-fluorophenyl, p-chlorophenyl and p-bromophenyl, or one of R_1 and R_2 is hydrogen and the other is chlorine;

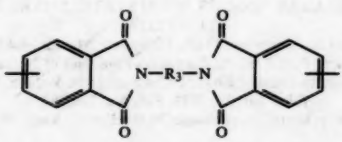
y is fluorine;

m is 0, 1, 2, 3, 4 or 5; and

Z is a divalent linkage of formula:



in which X is —CO— or —SO_2—; or



in which R_3 is an aromatic hydrocarbon radical or aromatic hydrocarbon ether radical having from 6 to 20 carbon atoms, and halogenated derivatives thereof.

5,182,359

MELT-STABLE POLYESTER RESINS AND MOLDED ARTICLES THEREOF

Keiichi Kanaka, and Kenji Hijikata, both of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Jun. 27, 1991, Ser. No. 720,156
Claims priority, application Japan, Jun. 29, 1990, 2-174142
Int. Cl.[5] C08G *63/00, 63/02*
U.S. Cl. 528—193 **11 Claims**

1. A moldable polyester resin having high melt-phase stability said polyester resin having a carboxyl end group concentration of no greater than 40 milliequivalent/kg, and is the reaction product of (a) an aromatic dicarboxylic acid or its ester-forming derivative, (b) an aliphatic dihydroxy compound having 2 to 8 carbon atoms, and (c) an ester-forming comonomer having the general formula (I):

HO—R—O—A—O—R—OH (I)

wherein A represents a divalent organic radical having at least one aromatic ring, R represents a divalent organic radical selected from the group consisting of aliphatic hydrocarbon groups and polyoxyalkylene groups each having 2 to 8 carbon atoms, and wherein said ester-forming comonomer is incorpo-

rated into the polyester resin chain in an amount between 0.01 to 7 molar % based on the aromatic dicarboxylic acid.

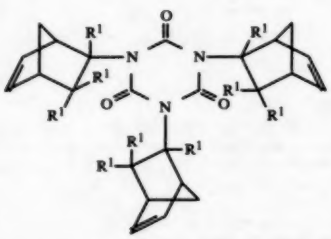
5,182,360

TRIS(NORBORNENYL) ISOCYANURATE

Anthony F. Jacobine, Meriden, and Steven T. Nakos, Andover, both of Conn., assignors to Loctite Corporation, Hartford, Conn.

Filed Oct. 17, 1991, Ser. No. 778,007
Int. Cl.[5] C08G 75/04; C07D 251/34
U.S. Cl. 528—205 7 Claims

1. A tris(norbornenyl) isocyanurate compound of the formula:



wherein R^1 is either hydrogen or an alkyl group.

5. A curable thiol-ene composition comprising a compound having a plurality of thiol groups and a compound as in claim 1.

5,182,361

METHOD FOR THE CONTINUOUS PREPARATION OF AROMATIC POLYCARBONATE HAVING A HIGH MOLECULAR WEIGHT WITH STATIC MIXER AND PLUG FLOW

Hendricus H. Maria van Hout, Halsteren; Martin H. Oyevaar, Goes, and Bert J. Held, Bergen op Zoom, all of Netherlands, assignors to General Electric Company, Mt. Vernon, Ind.

Filed Jul. 29, 1991, Ser. No. 736,884
Claims priority, application Netherlands, Aug. 29, 1990, 9001887
Int. Cl.[5] C08G 64/20
U.S. Cl. 528—371 7 Claims

1. A method for the continuous preparation of aromatic polycarbonate having a high molecular weight by boundary face condensation of carbonate oligomer with catalyst in the presence of an aromatic monohydroxy compound as a chain stopper, base, water and organic solvent at a temperature of at most 70° C., comprising polycondensing is carried out by mixing components, in static mixers to form a fine dispersion and reacting the dispersion in a residence zone with plug flow and repeating this combination of steps at least once.

5,182,362

PROCESS FOR PRODUCING VINYL CHLORIDE RESIN OF IMPROVED DISPERSIBILITY BY DEHYDRATION OF LATEX

Masaki Asahi, and Yukio Noro, both of Yokkaichi, Japan, assignors to Mitsubishi Kasei Vinyl Company, Tokyo, Japan

Continuation of Ser. No. 299,537, Jan. 23, 1989, abandoned. This application Jul. 1, 1991, Ser. No. 726,726
Claims priority, application Japan, Feb. 15, 1988, 1-32462
Int. Cl.[5] C08F 6/22, 6/14
U.S. Cl. 528—486 8 Claims

1. A process for producing a granular vinyl chloride resin of improved dispersibility for a paste resin from a vinyl chloride resin latex prepared by fine suspension polymerization, which comprises:

(A) flocculating the vinyl chloride resin latex,

(B) dehydrating the flocculated vinyl chloride resin to a water content of at most 50% by weight by means of a filter press dehydrator, a belt press dehydrator or a tube press dehydrator, and

(C) drying the dehydrated vinyl chloride resin at a temperature of from 30° to 60° C.

5,182,363

PROCESS FOR PRODUCING POWDER AGGREGATE PARTICLE OF HIGH MOLECULAR WEIGHT POLYCARBONATE RESIN

Toshiaki Asoh, and Tatsuhide Hosomi, both of Toyonaka, Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan

Filed Nov. 21, 1991, Ser. No. 795,544
Claims priority, application Japan, Nov. 30, 1990, 2-330352
Int. Cl.[5] C08G 64/40
U.S. Cl. 528—499 5 Claims

1. A process for producing powder aggregate particle of high molecular weight polycarbonate resin, which comprises adding a poor solvent to a solution containing 3 to 8% by weight of high molecular weight polycarbonate resin having a viscosity average molecular weight of at least 70,000 in a solvent in a ratio of the poor solvent to the solution of the polycarbonate resin of 0.2 to 0.6 by volume, continuously pouring the resulting mixture into water heated to a higher temperature than a boiling point of a solvent of the solution of the polycarbonate resin, thereby suspending the mixture in the warm water, distilling out solvent and poor solvent from the mixture, thereby obtaining a slurry of the polycarbonate resin and water in the following ratio by volume:

Solvent/polycarbonate resin $\leqq 0.55$

Solvent/poor solvent $\leqq 0.7$,

and recycling at least a portion of the slurry to a wet-process pulverizer, while further distilling out solvent and the poor solvent from the slurry.

5,182,364

POLYPEPTIDE ANALOGS OF APOLIPOPROTEIN E

Cheryl A. Dyer, Poway; Linda K. Curtiss, San Diego, and Richard Smith, Del Mar, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Filed Feb. 26, 1990, Ser. No. 485,158
Int. Cl.[5] C07K 7/00; A61K 37/02, 37/00
U.S. Cl. 530—324 1 Claim

1. A composition for modulating hepatic uptake of low density lipoprotein comprising a therapeutically effective amount of a polypeptide having an LDL-receptor binding segment and an LDL binding segment, said LDL-receptor binding segment having an amino acid residue sequence represented by the formula:

Leu-Arg-Lys-Leu-Arg-Lys-Arg-Leu-Leu-Arg-Asp-Ala-Asp-Asp-Leu-Leu-Arg-Lys-Leu-Art-Lys-Arg-Leu-Leu-Arg-Asp-Ala-Asp-Asp-Leu,

and said LDL binding segment having an amino acid residue sequence represented by the formula:

Glu-Trp-Leu-Lys-Ala-Phe-Tyr-Glu-Lys-Val-Leu-Glu-Lys-Leu-Lys-Glu-Leu-Phe, and a suitable carrier therefor.

5,182,365
OSTEOGENIC PROTEINS
Hermann Oppermann; Thangavel Kuberasampath, both of Medway; David C. Rueger, West Roxbury, and Engin Ozkaynak, Milford, all of Mass., assignors to Stryker Corporation, Kalamazoo, Mich.
Division of Ser. No. 315,342, Feb. 23, 1989, Pat. No. 5,011,691, which is a continuation-in-part of Ser. No. 232,630, Aug. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 179,406, Apr. 8, 1988, Pat. No. 4,968,590. This application Dec. 4, 1990, Ser. No. 621,988
Int. Cl.[5] A61K *37/02*; C07K *5/00, 7/00, 15/00*
U.S. Cl. 530—326 16 Claims

1. A protein, produced by expression of recombinant DNA in a host cell substantially of other contaminating proteins and comprising a pair of polypeptide chains, each of which has less than about 200 amino acids in a sequence sufficiently duplicative of the sequence of COP-5 or COP-7 such that said pair of polypeptide chains, when disulfide bonded to produce a dimeric species, has a conformation capable of inducing bone or cartilage formation in association with a matrix when implanted in a mammal.

5,182,366
CONTROLLED SYNTHESIS OF PEPTIDE MIXTURES USING MIXED RESINS
Verena D. Huebner, 512 Zinnia Ct., Benicia, Calif. 94510, and Daniel V. Santi, 211 Belgrave Ave., San Francisco, Calif. 94117
Filed May 15, 1990, Ser. No. 523,791
Int. Cl.[5] C07K *1/00, 1/04*
U.S. Cl. 530—334 25 Claims

1. A method of preparing a mixture of peptides having different amino acid sequences, which mixture contains retrievable and analyzable amounts of each peptide, comprising:
(a) dividing an amount of a mixture of amino acyl or peptide derivatized resins into a plurality of subamounts;
(b) coupling a different single amino acid with each of the subamounts of resin to obtain a plurality of different peptide resins the coupling being carried out under conditions such that it is driven to substantial completion with each subamount; and
(c) combining known amounts of the different peptide resins together to obtain the mixture of peptides; which mixture contains retrievable and analyzable amounts of each of the peptide resins.

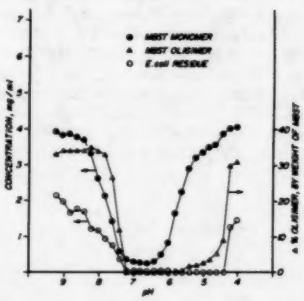
5,182,367
5-LIPOXYGENASE ACTIVATING PROTEIN
John W. Gillard, Baie D'Urfe; Jacques-Yves Gauthier, Laval; Jillian F. Evans, St. Lambert; Rejean Fortin, Montreal Nord; Yvan Guinon, Montreal, all of Canada; Richard A. F. Dixon, Houston, Tex., and Douglas K. Miller, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J. and Merck Frosst Canada, Inc., Kirkland, Canada
Continuation-in-part of Ser. No. 451,268, Dec. 15, 1989, abandoned. This application Nov. 30, 1990, Ser. No. 618,449
Int. Cl.[5] C07K *13/00*
U.S. Cl. 530—350 3 Claims

1. The essentially pure 5-lipoxygenase activating protein (FLAP), characterized in that it has a molecular weight of 18 kD as determined by SDS-PAGE under reducing conditions.

5,182,368
LIGANDS AND METHODS FOR AUGMENTING B-CELL PROLIFERATION
Jeffrey A. Ledbetter, 616 NW. 67th St., Seattle, Wash. 98117, and Edward A. Clark, 1505 16th East, Seattle, Wash. 98112
Continuation of Ser. No. 873,884, Jun. 13, 1986, abandoned. This application May 24, 1991, Ser. No. 708,075
Int. Cl.[5] C07K *15/28, 3/00*
U.S. Cl. 530—388.73 11 Claims

1. A substantially pure ligand that (a) binds to Bp50, a 50 kilodalton B-cell surface antigen defined by monoclonal antibody G28-5; (b) upon binding to an activated B-cell stimulates the activated B-cell to traverse the cell cycle so that proliferation of the B-cell is augmented; and (c) upon binding to resting B-cells does not, in the absence of other factors, stimulate proliferation which ligand is the monoclonal antibody produced by a hybridoma cell line as deposited with the ATCC and having accession number HB9110, or an Fv, Fab, $F(ab')_2$ or Fab' portion of said monoclonal antibody.

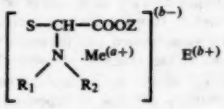
5,182,369
METHOD FOR PURIFYING SOMATOTROPIN MONOMERS
Stephen B. Storrs, Glencoe, Mo., and Jeffrey S. Schorey, San Antonio, Tex., assignors to Monsanto Company, St. Louis, Mo.
Filed Feb. 28, 1990, Ser. No. 486,476
Int. Cl.[5] C07K *3/24*
U.S. Cl. 530—647 40 Claims



1. A method for the purification and recovery of somatotropin monomer which comprises
a. obtaining a mixture of somatotropin proteins comprising somatotropin monomer and somatotropin oligomer in aqueous solution containing a chaotropic agent selected from the group consisting of urea, guanidine hydrochloride, sodium thiocyanate and chaotropic detergents at a pH greater than about 7;
b. preferentially precipitating a major portion of the somatotropin oligomer from said solution while maintaining a major portion of somatotropin monomer in solution by reducing the pH of said solution to less than about 6.5; and
c. removing the precipitate to recover the somatotropin monomer remaining in solution.

5,182,370
PARAMAGNETIC CHELATES
Ernst Felder, Vitale, Switzerland; Luciano Fumagalli; Fulvio Uggeri, and Giorgio Vittadini, all of Milan, Italy, assignors to Bracco Industria Chimica S.p.A., Milan, Italy
Continuation-in-part of Ser. No. 2,115, Jan. 12, 1987, Pat. No. 4,916,246. This application Dec. 13, 1989, Ser. No. 450,225
Claims priority, application Italy, Jan. 30, 1986, 19236 A/86
The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.
Int. Cl.[5] C07F *13/00, 15/02, 5/00*
U.S. Cl. 534—16 7 Claims

1. A compound having the formula



wherein:

a is 2 or 3;

b is an integer from 0 to 4;

$Me^{(a+)}$ is an ion of an element of atomic number from 57 to 70 or an ion of a transition metal of atomic number 21–29, 42 or 44;

$E^{(b+)}$ is one or more physiologically bicompatible cation of an inorganic or an organic base or amino acid, said cation representing a total positive charge of b units;

S is the group —A—O—R wherein:

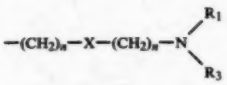
A is $—(CH_2)_m—$; $—CH_2—C(CH_3)_2—$;

m is an integer from 1 to 5;

R is H; linear or branched alkyl of 1 to 8 carbon atoms, said carbon atoms being unsubstituted or substituted by one or more hydroxy group; aralkyl of 1 to 4 aliphatic carbon atoms; phenyl or phenyl substituted by halogen, amino, hydroxy or trifluoromethyl; (poly)-oxa-alkyl of 1 to 10 oxygen atoms and from 3 to 30 carbon atoms;

R_1 is R_2 or $—CH_2COOZ$; $—CH(CH_3)COOZ$; $—(CH_2)_n—N(CH_2COOZ)_2$; hydroxy-arylalkyl radical in which the aryl radical is unsubstituted or substituted by hydroxy;

R_2 is $—CH_2COOZ$; $—CH(CH_3)COOZ$ with the proviso that when R_1 is $—CH_2COOZ$ or $—CH(CH_3)COOZ$, R_2 is other than $—CH_2COOZ$ and $—CH(CH_3)COOZ$;



wherein:

R_3 is $—CH_2COOZ$; $—CH(CH_3)COOZ$; a monovalent radical having the structure S—CH—COOZ;

X is a direct chemical bond; —O—; —S—; —NH—; —N—CH_2COOZ; —N—$CH(CH_3)COOZ$;

n is the integer 2 or 3, with the proviso that when X is a direct chemical bond, n is 1, 2 or 3;

Z is H or a negative charge;

with the proviso that, unless R represents a trifluoromethyl substituted phenyl or R_1 is R_2, $Me^{(a+)}$ is different from $Fe^{(2+)}$, $Fe^{(3+)}$, $Gd^{(3+)}$ and $Mn^{(2+)}$ and with the proviso that when R_1 is R_2 every molecule can contain not more than 500 nitrogen atoms.

5,182,371

DOUBLED PHENYL- OR NAPHTHYL-AZOBENZENES HAVING A PLURALITY OF REACTIVE GROUPS AND INTERMEDIATES THEREOF

Bernd Siegel, Ludwigshafen, and Manfred Patsch, Wachenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

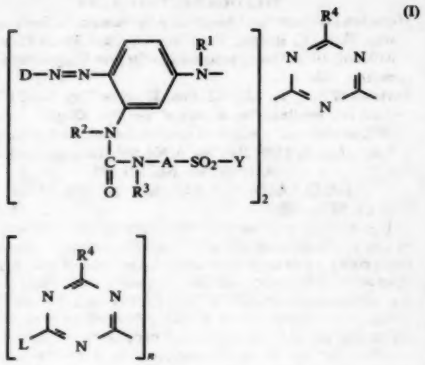
Filed Feb. 14, 1992, Ser. No. 835,484

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1991, 4107692

Int. Cl.[5] **C09B** *62/09, 62/513;* **D06P** *1/38*

U.S. Cl. 534—612 **3 Claims**

1. A reactive dye of the formula I

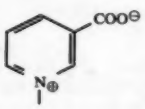


where

n is 0 or 1,

R^1, R^2 and R^3 are identical or different and each is independently of the others hydrogen, C_1–C_4-alkyl or phenyl

R^4 is fluorine, chlorine, bromine, C_1–C_4-alkylsulfonyl, phenylsulfonyl or a radical of the formula



L is a bridge member,

A is C_2–C_8-alkylene which may be interrupted by from 1 to 3 oxygen atoms in ether function, imino groups or C_1–C_4-alkylimino groups,

Y is vinyl or a radical of the formula $—CH_2—CH_2—Q$, where Q is a group which is detachable under alkaline reaction conditions, and

D is phenyl or naphthyl, which may each be monosubstituted or polysubstituted by hydroxysulfonyl, carboxyl, C_1–C_4-alkoxycarbonyl, cyano, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, nitro or vinylsulfonyl.

5,182,372

ANILINE-BASED OIL-SOLUBLE AZO DYES

Bernd Derber, Limburgerhof; Guenter Hansen, Ludwigshafen; Helmut Reichelt, Neustadt; Christos Vamvakaris, Kallstadt, and Georg Zeidler, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

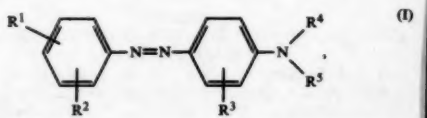
Filed Sep. 26, 1990, Ser. No. 589,789

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1989, 3931999

Int. Cl.[5] **C09B** *29/085;* **C10L** *1/00*

U.S. Cl. 534—857 **3 Claims**

1. An azo dye of formula I



in which

R^1, R^2 and R^3 are the same or different and independently denote hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,

R^4 denotes C_1–C_6-alkyl and

R^5 denotes C_2–C_8-alkyl which is substituted by hydroxy,

provided that the total number of carbon atoms in the radicals R^4 and R^5 is at least 5.

5,182,373

QUATERNARY AMMONIUM-SUBSTITUTED SAPONIN ETHERS

Young D. Kim, and Byung J. Ha, both of Seoul, Rep. of Korea, assignors to Pacific Chemical Co., Ltd., Seoul, Rep. of Korea

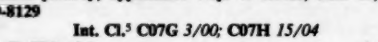
Filed May 30, 1990, Ser. No. 530,400

Claims priority, application Rep. of Korea, Jun. 13, 1989, 1989-8129

Int. Cl.[5] **C07G** *3/00;* **C07H** *15/04*

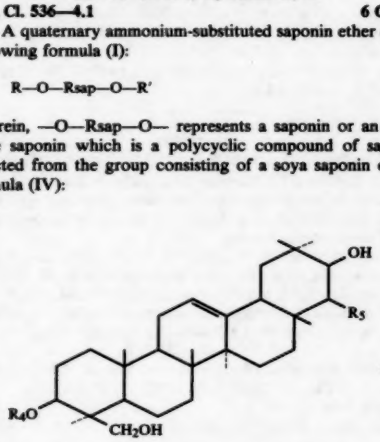
U.S. Cl. 536—4.1 **6 Claims**

1. A quaternary ammonium-substituted saponin ether of the following formula (I):



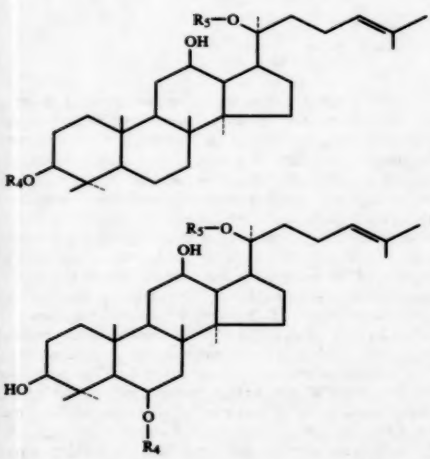
R—O—Rsap—O—R′ (I)

wherein, —O—Rsap—O— represents a saponin or an aglycone saponin which is a polycyclic compound of saponin selected from the group consisting of a soya saponin of the formula (IV):



(IV)

wherein both of R_4 and R_5 are a glucose moiety, or R_4 is a glucose moiety and R_5 is hydrogen atom; ginseng saponins of the formulae (Va) and (Vb):

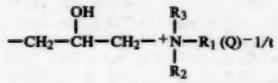


(Va)

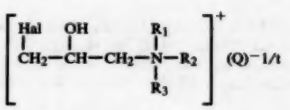
(Vb)

wherein, R_4 and R_5 are a glucose moiety; and aglycones thereof produced by removing the sugar moieties R_4 and R_5 from the saponins of formula (IV), (Va) or (Vb) and

R and R′ are hydrogen or a quaternary ammonium-containing substituent attached to the aglycone saponin or saponin and at least one of them is a quaternary ammonium-containing substituent of the following formula:



wherein, $(Q)^-$ is an anion of strong inorganic acid; R_1 is methyl; R_2 and R_3 are the same or different from each other and are each alkyl or an olefin group containing 18 or less carbon atoms; and t is the valency of the group Q, when prepared by reacting a saponin or aglycone saponin with a quaternary ammonium halohydrin of the following formula (II):



(II)

wherein, Hal is a leaving group; and $(Q)^-$, R_1, R_2, R_3 and t have the same meanings as above.

5,182,374

CLINDAMYCIN PHOSPHATE SYNTHESIS

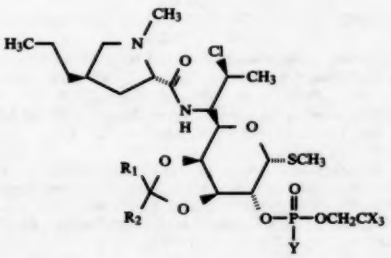
Martin Tobkes, Spring Valley; Simon Diaz, and Lalitha Krishnan, both of Suffern, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 21, 1990, Ser. No. 497,039

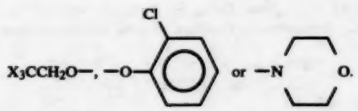
Int. Cl.[5] **C07M** *11/04*

U.S. Cl. 536—16.5 **4 Claims**

1. A compound of the formula:



where R_1 is lower alkyl, R_2 is lower alkyl or hydrogen, X is Cl or Br and Y is



5,182,375

DNA ENCODING FOLLISTATIN

Nicholas C. K. Ling, San Diego, Calif.; Naoto Ueno, Ibaraki, Japan; Shunichi Shimasaki, San Diego, Calif.; Frederick S. Esch, Foster City, Calif.; Shao-Yao Ying, San Diego, Calif., and Roger C. L. Guillemin, La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Division of Ser. No. 224,432, Jul. 26, 1988, Pat. No. 5,041,538, which is a continuation-in-part of Ser. No. 90,635, Aug. 28, 1987, abandoned. This application May 31, 1991, Ser. No. 708,753

Int. Cl.[5] C07K *13/00;* C07H *21/04;* C12N *15/12*

U.S. Cl. 536—23.5 7 Claims

1. A recombinant DNA molecule encoding mammalian follistatin which specifically inhibits basal secretion of follicle-stimulating hormone but does not inhibit basal secretion of luteinizing hormone.

5,182,376

DNA SEQUENCE FOR HORSERADISH PEROXIDASE C MODIFIED FOR EXPRESSION IN MAMMALIAN CELLS

Richard M. Edwards, Oxon, and Julian F. Burke, East Sussex, both of England, assignors to British Bio-Technology Limited, England

PCT No. PCT/GB88/00833, § 371 Date Jun. 4, 1990, § 102(e) Date Jun. 4, 1990, PCT Pub. No. WO89/03424, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 7, 1988, Ser. No. 469,452

Claims priority, application United Kingdom, Oct. 8, 1987, 8723662

Int. Cl.[5] C07H *15/12;* C12P *21/06;* C12N *9/08, 15/00*

U.S. Cl. 536—23.2 2 Claims

1. The DNA sequence of FIG. 6, which encodes horseradish peroxidase C.

5,182,377

PROBES FOR DETECTION OF HUMAN PAPILLOMAVIRUS

M. Michele Manos, Oakland; Deann K. Wright, San Francisco, and Yi Ting, Berkeley, all of Calif., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 243,486, Sep. 9, 1988. This application Mar. 10, 1989, Ser. No. 322,550

Int. Cl.[5] C07H *21/00;* C12Q *1/68*

U.S. Cl. 536—24.32 1 Claim

1. AN HPV L1 consensus probe selected from the group consisting of probes MY66, MY55, MY39, MY56, and MY57.

5,182,378

SULFATE DERIVATIVES OF GALACTAN EXTRACTED FROM KLEBSIELLA

Pierre Smets, Villennes sur Seine, and Rene Zalisz, Menucourt, both of France, assignors to Roussel Uclaf, Paris, France

Filed Dec. 4, 1990, Ser. No. 622,719

Claims priority, application France, Dec. 4, 1989, 89 15972

Int. Cl.[5] C08B *37/00;* A61K *31/70, 31/715*

U.S. Cl. 536—4.1 9 Claims

1. A sulfate derivative of galactan extracted from Klebsiella mainly comprised of sulfate neutral oses in a proportion of 20 to 90% of hydroxyls with a linear chain formation of galactose in position 1-3 and having a molecular weight of 5,000 to 12,000 and free of lipids and proteins.

5,182,379

ACID-CURABLE CELLULOSE ESTERS CONTAINING MELAMINE PENDENT GROUPS

Phillip M. Cook, and David S. Kashdan, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1990, Ser. No. 533,319

Int. Cl.[5] C08B *3/00*

U.S. Cl. 536—63 26 Claims

1. A substantially non-crosslinked modified cellulose ester comprising a cellulose ester having a melamine moiety grafted thereto.

5,182,380

DIHYDROXYPROPYL SULPHOETHYL CELLULOSES, THEIR PREPARATION AND THEIR USE

Jörn Breckwoldt, Rotenburg, and Klaus Szablikowski, Walsrode, both of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Filed Jul. 30, 1991, Ser. No. 737,636

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1990, 4024968

Int. Cl.[5] C08B *11/193;* C09K *7/02;* C04B *40/00, 24/38*

U.S. Cl. 536—90 8 Claims

1. Water-soluble, reversibly gelable cellulose ethers having an average degree of substitution with sulphoethyl groups (DS-sulphoethyl) of from 0.05 to 0.4 and a molar degree of substitution with dihydroxypropyl groups (MS-dihydroxypropyl) of from 0.1 to 1.

5,182,381

INTERMEDIATES FOR 3-KETO-19-NOR-$\Delta^{4,9}$-STEROIDS

Daniel Philibert, La Varenne Saint-Hilaire; Jean G. Teutsch, Pantin; Germain Costerousse, Saint-Maurice, and Roger Deraedt, Pavillons-sous-Bois, all of France, assignors to Roussel Ulcaf, Paris, France

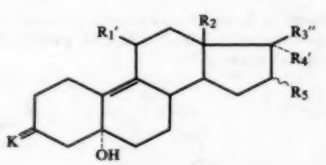
Continuation of Ser. No. 859,072, May 2, 1986, abandoned, which is a division of Ser. No. 746,176, Jun. 18, 1985, abandoned, which is a division of Ser. No. 618,590, Jun. 8, 1984, Pat. No. 4,540,686, which is a continuation of Ser. No. 469,042, Feb. 23, 1983, Pat. No. 4,477,445. This application Sep. 10, 1991, Ser. No. 757,261

Claims priority, application France, Mar. 11, 1982, 82 0338

Int. Cl.[5] C07J *1/00, 9/00, 17/00, 33/00*

U.S. Cl. 540—4 1 Claim

1. A compound of the formula



wherein R_1' is selected from the group consisting of thienyl, thienyl substituted with at least one member of the group consisting of halogen and alkyl and haloalkyl of 1 to 6 carbon atoms, furyl, cycloalkyl of 3 to 6 carbon atoms, naphthyl, phenylphenyl, alkyl of 1 to 6 atoms, alkenyl of 2 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms containing several double bonds and phenyl, phenyl substituted with at least one member of the group consisting of halogen, —OH, protected hydroxy, $—CF_3$, alkyl and alkoxy of 1 to 6 carbon atoms, alkenyloxy of 2 to 6 carbon atoms, phenoxy and alkylthio of 1 to 6 carbon atoms and alkylthio of 1 to 6 carbon atoms oxidized to sulfoxide or sulfonyl, R_2 is selected from the group consisting of methyl and ethyl, R_3'' is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, substituted alkyl of 1 to 6 carbon atoms, alkenyl and alkynyl of 2 to 6 carbon atoms, substituted alkenyl and alkynyl of 2 to 6 carbon atoms, the substituents being at least one member selected from the group consisting of alkylamino, dialkylamino and halogen, —OH, acetyl, acetyl protected in the form of a ketal, hydroxyacetyl, esterified carboxyalkyl of 2 to 4 carbon atoms and acyloxyalkyl and R_4' is selected from the group consisting of hydrogen, —OH, alkyl of 1 to 12 carbon atoms and alkenyl and alkynyl of 2 to 12 carbon atoms, substituted alkyl, alkenyl and alkynyl, the substituents being a member of the group consisting of alkylamino, dialkylamino, halogen, alkylthio, alkoxy,

trialkylsilyl and cyano with the alkyls of 1 to 6 carbon atoms or R_3'' is —CN and R_4' is a blocked —OH in the form of an easily cleavable ether, R_5 is selected from the group consisting of hydrogen and $—CH_3$ in the α- or β-position, K is blocked ketone in the form of a ketal, thioketal, oxime or methyloxime except the products wherein K is (1,2-ethanediyl)-acetal, R_5 is hydrogen and

a) R_2 is methyl and α) R_3'' is —CN, R_4' is trimethylsilyloxy and R_1' is selected from the group consisting of phenyl, methyl, ethyl, propyl, isopropyl, tert.-butyl, vinyl, allyl, isopropenyl, -o- and p-methoxyphenyl, thienyl, and p-fluorophenyl or p-trifluoromethylphenyl or β) R_3'' is —OH, R_4' is ethynyl or methyl and R_1' is selected from the group consisting of ethyl, propyl, vinyl, isopropenyl, allyl, isopropyl, thienyl, phenyl and o- and p-methylphenyl or γ) R_3'' is acetyl, i) R_4' is —OH and R_1' is ethyl, vinyl or phenyl or ii) R_4' is methyl and R_1' is vinyl and δ) R_3'' is OH, R_4' is ethynyl and R_1' is p-fluorophenyl;

b) R_2 is ethyl, R_3'' is —OH, R_1' is vinyl and R_4' is hydrogen and with the proviso that K does not represent an ethylene ketal, propylene ketal, dimethyl ketal or diethyl ketal radical when R_5 is hydrogen R_2 is methyl, R_3'' is hydroxy, R_4' is methyl and R_1' is methyl.

5,182,382

PROCESSES FOR THE PREPARATION OF TITANIUMPHTHALOCYANINE TYPE X

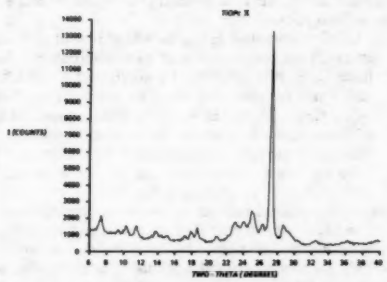
James D. Mayo, Toronto; James M. Duff, Mississauga; Terry L. Bluhm, Oakville, and Cheng K. Hsiao, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1991, Ser. No. 706,495

The portion of the term of this patent subsequent to Nov. 24, 2009, has been disclaimed.

Int. Cl.[5] O09B *67/50*

U.S. Cl. 540—141 **20 Claims**



1. A process for the preparation of titanyl phthalocyanine Type X consisting of dissolving titanyl phthalocyanine Type I in a solution of trifluoroacetic acid and methylene chloride; adding the resultant solution to a solvent mixture of alcohol and water in a ratio range of from 60:40 to 35:65 enabling the precipitation of Type X titanyl phthalocyanine; separating the titanyl phthalocyanine Type X from the solution; followed by a first washing with an aliphatic alkane alcohol wherein alkane contains from 1 to about 10 carbon atoms and a second washing with water; and thereafter a solvent treatment with fluorobenzene.

5,182,383

STABLE, CRYSTALLINE FORM OF A CEPHALOSPORIN INTERMEDIATE PRODUCT

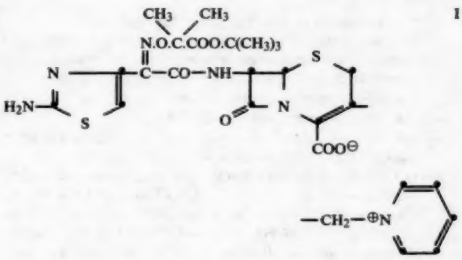
Bernhard C. Prager, Wörgl; Karl Wessely, and Werner Veit, both of Kufstein, all of Austria, assignors to Biochemie Gesellschaft m.b.H., Tyrol, Austria

Continuation of Ser. No. 382,144, Jun. 27, 1989, abandoned, which is a continuation of Ser. No. 211,536, May 5, 1988, abandoned. This application Feb. 23, 1990, Ser. No. 494,272

Int. Cl.[5] C07D *501/46*; A61K *31/545*

U.S. Cl. 540—225 **3 Claims**

1. The crystalline, stable form of (6R,7R)-7-[[2-(2-amino-4-thiazolyl)-(Z)-2-(1-tert.butoxycarbonyl-1-methylethoxy)imino]acetamido]-3-(1-pyridiniummethyl)-3-cephem-4-carboxylate (ceftazidime-t-butylester) of formula



I

having the X-ray spectrum

d (Å)	I
17.0	w
15.5	m
5.9	w
5.0	w
4.15	w
3.84	w
3.3	w

w = weak
m = medium

(α-form).

5,182,384

2-BENZOCOUMARINYL CARBAPENEMS

Frank DiNinno, Old Bridge; Thomas A. Rano, Somerville, and Mark L. Greenlee, Rahway, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

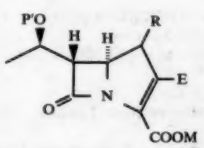
Filed May 24, 1991, Ser. No. 705,238

The portion of the term of this patent subsequent to Nov. 10, 2009, has been disclaimed.

Int. Cl.[5] C07D *487/04*

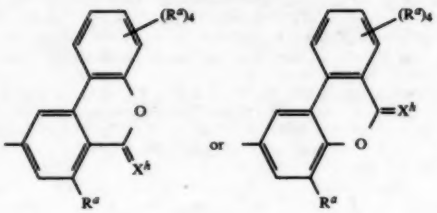
U.S. Cl. 540—302 **10 Claims**

1. A compound of the formula:



with E as

-continued



wherein:

R is H or CH_3;

X^b is O or S;

P' is a removable protecting group for hydroxy;

R^a are independently selected from the group consisting of hydrogen and the radicals set out below, provided that not more than four R^a radicals are other than hydrogen:

a) a trifluoromethyl group: $—CF_3$;

b) a halogen atom: —Br, —Cl, —F, or

c) C_1–C_4 alkoxy radical: $—OC_{1-4}$ alkyl, wherein the alkyl is optionally mono-substituted by R^q, where

R^q is a member selected from the group consisting of —OH, —OP', $—OCH_3$, —CN, $—C(O)NH_2$, $—OC(O)NH_2$, CHO, $—OC(O)N(CH_3)_2$, $—SO_2NH_2$, $—SO_2N(CH_3)_2$, $—SOCH_3$, $—SO_2CH_3$, —F, $—CF_3$, $—COOM^a$ (where M^a is hydrogen, alkali metal, methyl, phenyl or M defined below), tetrazolyl (where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by M^a as defined above) and $—SO_3M^b$ (where M^b is hydrogen or an alkali metal or M defined below);

d) a hydroxy or protected hydroxy: —OH or —OP';

e) a carbonyloxy radical: —O(C=O)Rs, where

R^s is C_{1-4} alkyl or phenyl, each of which is optionally mono-substituted by R^q as defined above or tri-substituted with —F;

f) a carbamoyloxy radical: $—O(C=O)N(R^y)R^z$ where

R^y and R^z are independently H, C_{1-4} alkyl (optionally mono-substituted by R^q as defined above), together a 3- to 5-membered alkylidene radical to form a ring (optionally substituted with R^q as defined above) or together a 2- to 4-membered alkylidene radical, interrupted by —O—, —S—, —S(O)— or $—S(O)_2$—, to form a ring (where the ring is optionally mono-substituted with R^q as defined above);

g) a sulfur radical: —S(O)n—Rs where n=0–2, and R^s is defined above;

h) a sulfamoyl group: $—SO_2N(R^y)R^z$ where R^y and R^z are as defined above;

i) azido: N_3

j) a formamido group: $—N(Rt)(C=O)H$, where

R^t is H or C_{1-4} alkyl, and the alkyl thereof is optionally mono-substituted by R^q as defined above;

k) a (C_{1-4} alkyl)carbonylamino radical: $—N(R^t)(C=O)C_{1-4}$ alkyl where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

l) a (C_1–C_4 alkoxy) carbonylamino radical: $—N(R^t)(C=O)OC_{1-4}$ alkyl, where R^t is as defined above, and the alkyl group is also optionally mono-substituted by R^q as defined above;

m) a ureido group: $—N(R^t)(C=O)N(R^y)R^z$ where R^t, R^y and R^z are as defined above;

n) a sulfonamido group: $—N(R^t)SO_2R^s$, where R^s and R^t are as defined above;

o) a cyano group: —CN;

p) a formyl or acetalized formyl radical: —(C=O)H or $—CH(OCH_3)_2$;

q) (C_1-C_4 alkyl)carbonyl radical wherein the carbonyl is acetalized: $—C(OCH_3)_2C_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

r) carbonyl radical: $—(C=O)R^s$, where R^s is as defined above;

s) a hydroximinomethyl radical in which the oxygen or carbon atom is optionally substituted by a C_1–C_4 alkyl group: $—(C=NOR^t)R^y$ where R^y and R^z are as defined above, except they may not be joined together to form a ring;

t) a (C_1–C_4 alkoxy)carbonyl radical: $—(C=O)OC_{1-4}$ alkyl, where the alkyl is optionally mono-substituted by R^q as defined above;

u) a carbamoyl radical: $—(C=O)N(R^y)R^z$ where R^y and R^z are as defined above;

v) an N-hydroxycarbamoyl or $N(C_1$–C_4 alkoxy)carbamoyl radical in which the nitrogen atom may be additionally substituted by a C_1–C_4 alkyl group: $—(C=O)—N(OR^t)R^z$ where R^y and R^z are as defined above, except they may not be joined together to form a ring;

w) a thiocarbamoyl group: $—(C=S)N(R^y)(R^z)$ where R^y and R^z are as defined above;

x) carboxyl: $—COOM^b$, where M^b is as defined above;

y) thiocyanate: —SCN;

z) trifluoromethylthio: $—SCF_3$;

aa) tetrazolyl, where the point of attachment is the carbon atom of the tetrazole ring and one of the nitrogen atoms is mono-substituted by hydrogen, an alkali metal or a C_1–C_4 alkyl optionally substituted by R^q as defined above;

ab) an anionic function selected from the group consisting of: phosphono $[P=O(OM^b)_2]$; alkylphosphono $\{P=O(OM^b)$-$[O(C_1$–C_4 alkyl)]$\}$; alkylphosphinyl $[P=O(OM^b)$-$(C_1$–C_4alkyl)]; phosphoramido $[P=O(OMb)N(R^y)R^z$ and $P=O(OMb)NHR^x]$; sulfino (SO_2M^b); sulfo (SO_3M^b); acylsulfonamides selected from the structures $CONM^bSO_2R^x$, $CONM^bSO_2N(R^y)R^z$, $SO_2\mu LM^bCON(R^y)R^z$; and SO_2NM^bCN, where

R^x is phenyl or heteroaryl, where heteroaryl is a monocyclic aromatic hydrocarbon group having 5 or 6 ring atoms, in which a carbon atom is the point of attachment, in which one of the carbon atoms has been replaced by a nitrogen atom, in which one additional carbon atom is optionally replaced by a heteroatom selected from O or S, and in which from 1 to 2 additional carbon atoms are optionally replaced by a nitrogen heteroatom, and where the phenyl and heteroaryl are optionally mono-substituted by R^q, as defined above; M^b is as defined above; and R^y and R^z are as defined above;

ac) C_5–C_7 cycloalkyl group in which one of the carbon atoms in the ring is replaced by a heteroatom selected from O, S, NH or $N(C_1$–C_4 alkyl) and in which one additional carbon atom may be replaced by NH or $N(C_1$–C_4 alkyl), and in which at least one carbon atom adjacent to each nitrogen heteroatom has both of its attached hydrogen atoms replaced by one oxygen thus forming a carbonyl moiety and there are one or two carbonyl moieties present in the ring;

ad) C_2–C_4 alkenyl radical, optionally monosubstituted by one of the substituents a) to ac) above and phenyl which is optionally substituted by R^q as defined above;

ae) C_2–C_4 alkynyl radical, optionally monosubstituted by one of the substituents a) to ac) above;

af) C_1–C_4 alkyl radical;

ag) C_1–C_4 alkyl mono-substituted by one of the substituents a)–ac) above;

ah) a 2-oxazolidinonyl moiety in which the point of attachment is the nitrogen atom of the oxazolidinone ring, the ring oxygen atom is optionally replaced by a heteroatom selected from —S— and NR^t (where R^t is as defined above) and one of the saturated carbon atoms of the oxazolidinone ring is optionally mono-substituted by one of the substituents a) to ag) above; and

M is a removable protecting group for hydroxy.

5,182,385

2-BIPHENYL-CARBAPENEMS INTERMEDIATES

Frank P. Dininno, Old Bridge, and Thomas N. Salzmann, North Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

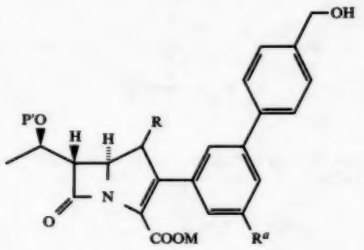
Filed Oct. 9, 1990, Ser. No. 594,767

The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.

Int. Cl.[5] C07D *487/04;* C07F *7/10;* A61K *31/40*

U.S. Cl. 540—302 3 Claims

1. A compound of the formula:



where

R is H or CH_3;

P' is a removable protecting group for hydroxy;

R^a is selected from the group consisting of H, Cl, Br, I, SMe, CN, CHO, SOMe, SO_2Me, and OP'; and

M is a removable protecting group for carboxyl.

5,182,386

CERTAIN IMIDAZOQUINOXALINONES; A NEW CLASS OF GABA BRAIN RECEPTOR LIGANDS

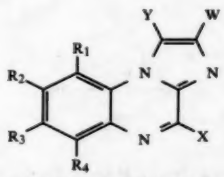
Pamela Albaugh, Clinton, and Alan J. Hutchinson, Madison, both of Conn., assignors to Neurogen Corporation, Branford, Conn.

Filed Aug. 27, 1991, Ser. No. 750,522

Int. Cl.[5] C07D *487/04, 241/44;* A61K *31/495*

U.S. Cl. 540—350 37 Claims

1. A compound of the formula:



and the pharmaceutically acceptable non-toxic salts thereof wherein:

R_1 and R_4 are the same or different and represent hydrogen, halogen or straight or branched chain lower alkyl having 1–6 carbon atoms, or straight or branched chain lower alkoxy having 1–6 carbon atoms;

X and Y are hydrogen, halogen, hydroxy or amino with the proviso that when X is hydrogen, halogen, or amino, Y is hydroxy, and when Y is hydrogen, halogen, or amino, X is hydroxy;

W is 2- or 3-thienyl; or phenyl, or 2- or 3-thienyl each of which is mono or disubstituted with halogen, hydroxy, straight or branched chain lower alkyl having 1–6 carbon atoms, straight or branched chain lower alkoxy having 1–6 carbon atoms, amino, or mono- or dialkylamino where each alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms; and

R_2 and R_3 are the same or different and represent hydrogen, halogen, hydroxy, or straight or branched chain lower alkyl having 1–6 carbon atoms; or R_5, OR_5, COR_5, CO_2R_5, or $OCOR_5$, where R_5 is hydrogen, straight or branched chain lower alkyl having 1–6 carbon atoms, phenyl, or phenylalkyl where the alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms; or —$CONR_6R_7$ or —$(CH_2)_nNR_6R_7$, where n is 0, 1, or 2, R_6 is hydrogen, straight or branched chain lower alkyl having 1–6 carbon atoms, and R_7 is hydrogen, straight or branched chain lower alkyl having 1–6 carbon atoms, phenyl, or phenylalkyl where the alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms; or —$CONR_6R_7$ or —$(CH_2)_nNR_6R_7$, where n is 0, 1, or 2, and NR_6R_7 forms a heterocyclic group which is morpholyl, piperidyl, pyrrolidyl, or N-alkylpiperizyl where the alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms; or —$NR_8CO_2R_9$ where R_8 and R_9 are the same or different and represent hydrogen, straight or branched chain lower alkyl having 1–6 carbon atoms, phenyl, or phenylalkyl where the alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms, or —$C(OH)R_{10}R_{11}$ where R_{10} and R_{11} are the same or different and represent straight or branched chain lower alkyl having 1–6 carbon atoms, phenylalkyl where the alkyl portion is straight or branched chain lower alkyl having 1–6 carbon atoms.

5,182,387

BIS-DIBENZOAZEPINE COMPOUNDS

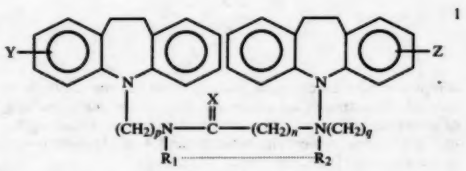
Jules Freedman, Cincinnati, and Alan J. Bitonti, Maineville, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Oct. 30, 1991, Ser. No. 784,496

Int. Cl.[5] C07D *223/24*

U.S. Cl. 540—590 15 Claims

1. A compound of the formula:



I

or a pharmaceutically acceptable salt thereof, wherein

X is O or H_2;

R_1 and R_2 are each independently H, C_1-C_4 alkyl, benzyl, or phenethyl, or, when there is a bond between R_1 and R_2 as represented by the dotted line, R_1 and R_2 taken together are ethylene;

Y and Z are each independently H, Cl, F, Br, C_1-C_4 alkyl, C_1-C_4 alkoxy, hydroxy or CF_3 moiety;

n is an integer of 1 to 10; and

p and q are each independently an integer of 2 to 4,

provided that when there is a bond between R_1 and R_2, X is H_2 and n is 1.

5,182,388

SALTS OF TRIAZINIC COMPOUNDS WITH OXYGENATED ACIDS OF PHOSPHORUS

Roberto Cipolli, Novara; Roberto Oriani; Gilberto Nucida, both of Milan, and Enrico Masarati, Piacenza, all of Italy, assignors to Ministero Dell' Universita' E Della Ricerca Scientifica E Tecnologica, Rome, Italy

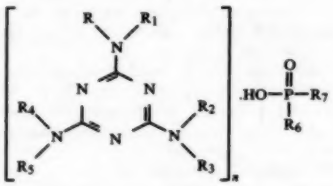
Filed Apr. 11, 1991, Ser. No. 683,425

Claims priority, application Italy, Apr. 11, 1990, 20007 A/90

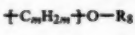
Int. Cl.[5] C07D *251/02*

U.S. Cl. 544—195 **4 Claims**

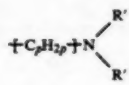
1. Salts of triazinic compounds with oxygenated acids of phosphorus, of the formula (I)



wherein at least one of the radicals R to R_5 is



or

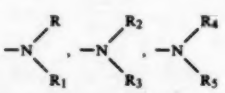


m=an integer between 2 and 8;

p=an integer between 2 and 6; R_8=is selected from the group consisting of a hydrogen atom, C_1–C_8 alkyl; C_2–C_6 alkenyl; and $[C_qH_{2q}]$—O—R_9, wherein q is an integer between 1 and 4 and R_9 is hydrogen or C_1–C_4 alkyl; C_6–C_{12} cycloalkyl or alkylcycloalkyl;

radicals R' are the same or different, and are selected from the group consisting of a hydrogen atom, C_1–C_8 alkyl; C_2–C_6 alkenyl; C_6–C_{12} cycloalkyl or alkylcycloalkyl; C_1–C_4 hydroxyalkyl, provided that radicals R_6 and R_7, hereinafter specified, are respectively different from H and OH; or the group:

is replaced by a heterocyclic radical bound to the alkyl chain through the nitrogen atom selected from the group consisting of aziridine; pirrolidine; piperidine; morpholine; thiomorpholine; piperazine; 4-methylpiperazine; and 4-ethylpiperazine or in the formula (I) at least one of the groups:



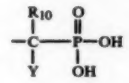
is replaced by a heterocyclic radical bound to the triazine ring through the nitrogen atom said heterocyclic radical selected from the group consisting of aziridine; pirrolidine; piperidine, morpholine; thiomorpholine; piperazine; 4-methylpiperazine; 4-ethylpiperazine; 2-methylpiperazine; 2,5-dimethylpiperazine; 2,3,5,6-tetramethylpiperazine; 2,2,5,5-tetramethylpiperazine; 2-ethylpiperazine; 2,5-diethylpiperazine the other radicals from R to R_5 are the same or different and have the above mentioned meaning or are selected from the group consisting of a hydrogen atom; C_1–C_{18} alkyl; C_2–C_8 alkenyl; C_6–C_{16} cycloalkyl or alkylcycloalkyl, optionally substituted by a hydroxy or C_1–C_4 hydroxyalkyl;

n is 0.5 to 6;

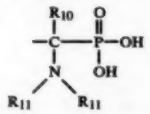
R_6 is selected from the group consisting of a hydrogen atom; OH; O—C_1–C_8 alkyl; O-phenyl, optionally substituted by a C_1–C_8 alkyl; aralkyl, optionally substituted by a C_1–C_4 alkyl; C_1–C_4 alkyl, optionally substituted by a carboxylic group; aryl;

R_7 is hydrogen; OH; —O—C_1–C_8 alkyl; O-phenyl; C_1–C_4 alkyl; aryl;

R_7 is:



wherein R_{10} is a hydrogen atom or C_1–C_{12} alkyl; and Y is OH or R_{10};

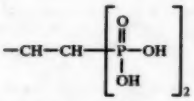


wherein R_{10} has the previously defined meaning and radicals R_{11} are the same or different and are a hydrogen atom or C_1–C_4 alkyl;

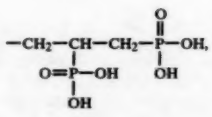
or the group:

is replaced by a heterocyclic radical bound to the carbon atom through the nitrogen atom and optionally containing a second heteroatom selected from the group consisting of S, O and N;

wherein R_{12} is a hydrogen atom or C_1–C_8 alkyl and s is an integer between 1 and 3;



wherein R_{13} is hydrogen or hydroxyl;



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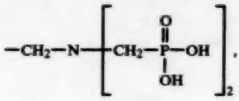
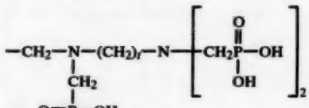
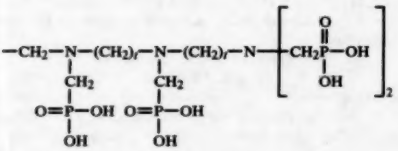
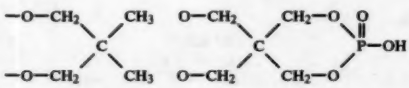






wherein t is an integer between 2 and 6; or R_6 and R_7 together may form a cyclic structure of the formula;



5,182,389

PROCESS FOR THE PREPARATION OF 2-(2',4'-DIHYDROXYPHENYL)-4,6-DIARYL-S-TRIAZINES

Kurt Burdeska, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

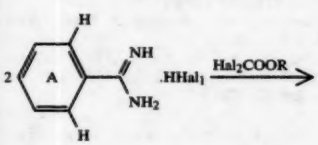
Filed Jan. 30, 1992, Ser. No. 828,053

Claims priority, application Switzerland, Jan. 31, 1991, 291/91; Sep. 23, 1991, 2788/91

Int. Cl.[5] C07D *251/22*

U.S. Cl. 544—219 **7 Claims**

1. A process for the preparation of a 2-hydroxy-4,6-diaryl-s-triazine of formula (2), which comprises reacting an aqueous alkaline solution of a benzamidine hydrohalide in the temperature range from 0° to 80° C. with an alkyl halocarbonate to an alkyl benzimidoylcarbamate, adding an inert organic solvent to the resultant emulsion, and reacting the organic phase containing the alkyl benzimidoylcarbamate to give the 2-hydroxy-4,6-diaryl-s-triazine according to the reaction scheme



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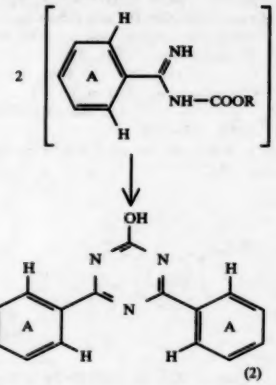


wherein Hal_1 and Hal_2 are halogen and R is C_1–C_4alkyl, and the rings A may be further substituted by halogen, hydroxy, lower alkyl, lower alkoxy or lower alkoxycarbonyl.

5,182,390

ISOCYANURIC ACID DERIVATIVE USEFUL AS A LIGHT STABILIZER

Seiji Sagawa, Tokyo; Toshio Kano, Sagamihara; Shinichi Yachigo, Toyonaka, and Kanako Ida, Ashiya, all of Japan, assignors to Kyodo Chemical Company Limited, Tokyo, Japan and Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 28, 1991, Ser. No. 783,225

Claims priority, application Japan, Oct. 29, 1990, 2-292559

Int. Cl.[5] C07D *401/14*

U.S. Cl. 544—222 **2 Claims**

1. Tris[2-hydroxy-3-(2,2,6,6-tetramethyl-4-piperidylamino)-propyl] isocyanurate.

5,182,391

PROCESS AND INTERMEDIATES FOR THE PREPARATION OF OXOPHTHALAZINYL ACETIC ACIDS AND ANALOGS THEREOF

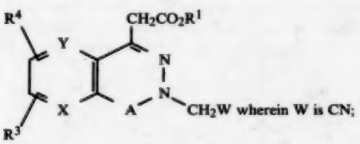
Banavara L. Mylari, Waterford, and William J. Zembrowski, Oakdale, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 768,784, Sep. 30, 1991, which is a division of Ser. No. 540,000, Jun. 15, 1990, Pat. No. 5,075,442, which is a division of Ser. No. 350,997, May 11, 1989, Pat. No. 4,954,269. This application Jun. 30, 1992, Ser. No. 906,778

Int. Cl.[5] C07D *519/00, 417/06, 487/04, 471/04*

U.S. Cl. 544—236 **1 Claim**

1. A compound of the formula



R^1 is C_1–C_6 alkyl; R^3 and R^4 are the same or different, and are trifluoromethyl, or C_1–C_4 alkyl; one of X and Y is CH and the other is N, and A is C═O.

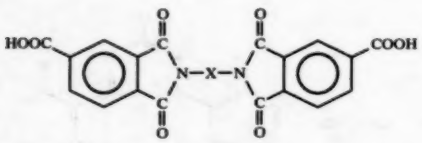
5,182,392

PROCESS FOR PRODUCING BISTRIMELLITIC IMIDE

Hiroka Tanisake; Takeshi Koyama, and Tsuyoshi Isozaki, all of Hiratsuka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 14, 1991, Ser. No. 791,534
Claims priority, application Japan, Nov. 19, 1990, 2-311397
Int. Cl.[5] C07D *207/40*
U.S. Cl. 548—520 **2 Claims**

1. A process for producing a bistrimellitic imide of the formula (2)



(2)

wherein X is an aliphatic group having at least 2 carbon atoms, an alicyclic group or an aromatic group, which comprises reacting a trimellitic anhydride with a diamine of the formula (1)

(1)

wherein X is as defined above, in the presence of a solvent mixture containing an aprotic polar solvent and an aromatic hydrocarbon solvent which can be distilled azeotropically with water while water formed as a byproduct is removed with the aromatic hydrocarbon by azeotropic distillation and the bistrimellitic imide formed is precipitated in the reaction system, the amount of the aromatic hydrocarbon solvent being 10 to 90% by weight based on the total weight of these two solvents.

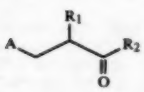
5,182,393

PROCESS FOR PRECURSORS TO CALCITRIOL AND RELATED COMPOUNDS

George P. Yiannikouros, Westfield, and Percy S. Manchand, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 742,796, Aug. 9, 1991, abandoned. This application Mar. 11, 1992, Ser. No. 848,881
Int. Cl.[5] C07D *333/50*; C07J *75/00, 9/00, 71/00*
U.S. Cl. 549—4 **6 Claims**

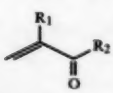
1. A process for the preparation of a compound of the formula



IV

wherein A is a 23,24-bisnorsteroid or a 23,24-bisnor-9,10-secosteroid radical, R_1 is hydrogen, hydroxycarbonyl, lower alkoxycarbonyl, lower alkylcarbonyl or unsubstituted or substituted lower alkyl, and R_2 is hydroxyl, lower alkoxy, or unsubstituted or substituted lower alkyl,

(1) which comprises reacting a compound of the formula



III

with a nickel salt hydrate or, if unhydrated, in the presence of a proton source and a reducing agent; in the presence of an organic solvent and ligand source, and thereafter,

(2) treating the reaction product of step 1, with a compound of the formula

II

wherein A is as previously described, and X is halogen to yield the corresponding compound of formula IV.

5,182,394

LIQUID CRYSTALLINE DIGLYCIDYL COMPOUNDS

Ki-Soo Kim, Katonah, N.Y., assignor to Akzo N.V., Arnhem, Netherlands

Filed Jan. 14, 1992, Ser. No. 820,187
Int. Cl.[5] C07D *303/16*
U.S. Cl. 549—557 **3 Claims**

1. A liquid crystalline compound which is the diglycidyl ether of a 1,4 -bis (p-hydroxybenzoyloxy) cyclohexane.

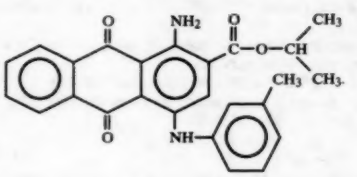
5,182,395

ISOPROPYL 1-AMINO-4-M-TOLUIDINOANTHRAQUINONE-2-CARBOXYLATE

Keisuke Takuma; Tsukasa Ohyama; Akitoshi Igata; Tamio Mikoda, all of Ohmuta; Isamu Ghoda, Kobe, and Hitoshi Koshida, Nishinomiya, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Division of Ser. No. 337,859, Apr. 14, 1989, Pat. No. 5,002,925. This application Oct. 12, 1990, Ser. No. 596,182
Claims priority, application Japan, Apr. 14, 1988, 63-90170
Int. Cl.[5] C07C *225/34*
U.S. Cl. 552—251 **1 Claim**

1. Isopropyl 1-amino-4-m-toluidinoanthraquinone-2-carboxylate represented by the formula



(I)

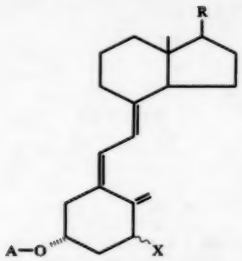
5,182,396

1-HYDROXYVITAMIN D DERIVATIVES

Yoji Tachibana, Kawagoe, Japan, assignor to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

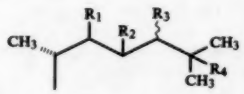
Filed Mar. 25, 1992, Ser. No. 857,373
Claims priority, application Japan, Mar. 29, 1991, 3-89175
Int. Cl.[5] C07J *175/00*
U.S. Cl. 552—653 **7 Claims**

1. A 1-hydroxyvitamin D derivative having the formula (I)



(I)

wherein A represents an acyl residue derived from vitamin A acid, X means a hydroxyl group and R represents a group of the formula (II)



(II)

wherein R_1 and R_2 each represent hydrogen atoms or together form a carbon-carbon double bond, R_3 represents a hydrogen atom, a C_1–C_4 alkyl group or a hydroxyl group and R_4 represents a hydrogen atom or a hydroxyl group.

5,182,397

ARYLOXYSPIROALKYLINDOLINONE HERBICIDES

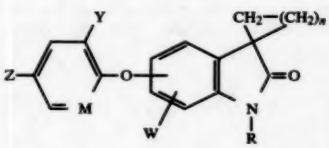
Michael E. Condon, Lawrenceville; Gary M. Karp, Plainsboro, both of N.J., and Jeffrey H. Birk, Morrisville, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 531,712, May 31, 1990, Pat. No. 5,076,835. This application Jul. 31, 1991, Ser. No. 738,398

Int. Cl.[5] C07D *221/20*

U.S. Cl. 546—15 **5 Claims**

1. A process for the preparation of a compound having the structure of formula I



(I)

wherein

M is N or CX;

X, Y and Z are each independently hydrogen, halogen, CN, NO_2 or C_1–C_6 alkyl optionally substituted with one or more halogens;

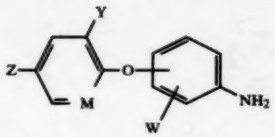
W is hydrogen, halogen, CN, NO_2, C_1–C_6 alkoxy, C_1–C_6 carboalkoxy or C_1–C_6 alkyl optionally substituted with one or more halogens or OR_1 groups with the proviso that at least two of W, X, Y and Z must be other than CN or NO_2;

n is an integer of 1, 2, 3, 4 or 5;

R is C_1–C_6 alkyl; and

R_1 is hydrogen or C_1–C_4 alkyl

which comprises reacting a compound having the structure of formula III



(III)

wherein M, Y, Z and W are as described above with at least one molar equivalent of the chlorosulfonium salt of a C_1–C_4 alkyl ester of methylthioacetic acid in the presence of at least 1 equivalent of a base and a non-protic solvent at a temperature range of about −78° C. to −30° C. to form a first intermediate, reacting said first intermediate with at least one additional equivalent of a base to form a second intermediate, heating said second intermediate in the presence of an acid and a non-protic solvent at a temperature range of greater than about 90° C. to form an aryloxy-3-(methylthio)-2-indolinone, reacting said aryloxy-3-(methylthio)-2-indolinone with sufficient Raney Nickel in a suitable protic solvent to form the corresponding aryloxy-2-indolinone, reacting said aryloxy-2-indolinone with dialkylsulfate in the presence of an alkali metal hydride and a suitable solvent to form an aryloxy-1-alkyl-2-indolinone and reacting said aryloxy-1-alkyl-2-indolinone with a dihaloalkane of formula VI

$$\text{Halogen-(CH}_2\text{)}_m\text{-Halogen} \qquad \text{(VI)}$$

wherein m is an integer of n+1 in the presence of at least 2 equivalents of an alkali metal hydride and a polar solvent to give the compound of formula I.

5,182,398

α-AMINO ACID DIAMIDE AND USE THEREOF AS CUPRIC ION-TRANSPORTING IONOPHORE

Kazuyuki Kasuga; Takuji Hirose; Toshikazu Takahashi, and Kazuhisa Hiratani, all of Tsukuba, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Japan

Filed Feb. 25, 1992, Ser. No. 840,546

Claims priority, application Japan, Dec. 17, 1991, 3-353342

Int. Cl.[5] C07D *215/38*

U.S. Cl. 546—171 **6 Claims**

1. A diamide expressed by the following general formula (I): wherein R^1 and R^2 stand, independently from each other, for a hydrogen atom, an alkyl group, an aralkyl group or an aryl group.

5,182,399

PROCESS FOR PREPARING PIPERIDINYL BENZIMIDAZOLES

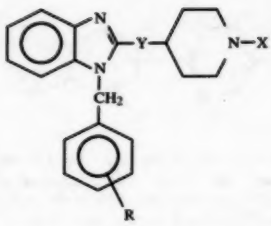
John M. Kane, Cincinnati, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 452,920, Dec. 18, 1989, abandoned, which is a division of Ser. No. 256,959, Oct. 13, 1988, Pat. No. 4,908,372. This application Jul. 18, 1991, Ser. No. 732,994

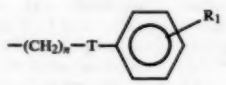
Int. Cl.[5] C07D *401/06*

U.S. Cl. 546—199 **7 Claims**

1. A process for producing a piperidinyl benzimidazole of the formula:

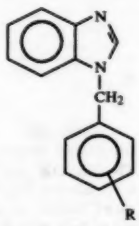


wherein Y is represented by CO; R is represented by C_{1-4} alkyl, C_{1-4} alkoxy, halogen, hydroxy and hydrogen, X is $COOR_2$ in which R_2 is represented by a C_{1-4} alkyl, or X is an alkylene phenyl radical of the formula:



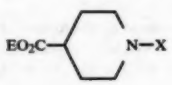
wherein T is represented by O, or a direct bond; R_1 is represented by C_{1-4} alkyl, C_{1-4} alkoxy, halogen, hydroxy, 2,2-dimethyl ethanoic acid and hydrogen; n is an integer from 1 to 5; or a pharmaceutically acceptable acid addition salt thereof; comprising: carrying out an acylation reaction between:

a) a benzimidazole of the formula



wherein R is as defined above, and;

b) a piperidinyl derivative of the formula:



wherein X is as defined above and E is a C_{1-4} alkyl;

c) in the presence of n-butyl lithium.

5,182,400

PROCESS FOR THE PREPARATION OF ESTERS OF 5-ALKYLPYRIDINE-2,3-DICARBOXYLIC ACID

Jurgen Weber, Oberhausen; Peter Lappe, Dinslaken, and Helmut Springer, Oberhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 7, 1991, Ser. No. 741,603

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1990, 4025076

Int. Cl.[5] C07D *213/55, 213/69, 213/803*

U.S. Cl. 546—250 **15 Claims**

1. A process for the preparation of esters of 5-alkylpyridine-2,3-dicarboxylic acid comprising reacting 2-oxosuccinic acid esters with 2-alkylacrolein oximes in the presence of at least one acid catalyst.

5,182,401

PREPARATION OF 3-AMINO-2-(HET)AROYL-ACRYLIC ACID DERIVATIVES

Klaus Grohe, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

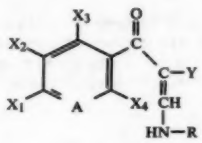
Filed May 2, 1991, Ser. No. 694,692

Claims priority, application Fed. Rep. of Germany, May 12, 1990, 4015299

Int. Cl.[5] C07D *213/50*

U.S. Cl. 546—287 **7 Claims**

1. A process for the preparation of a 3-amino-2-(het)aroylacrylic acid derivative of the formula



(I)

in which

Y represents a nitrile, an ester group —$COOR_1$, or an acetyl group,

R^1 denotes C_1–C_4-alkyl and

R denotes alkyl having 1 to 6 carbon atoms, 2-fluoroethyl, 2-chloroethyl, 2-hydroxyethyl, 1-(hydroxymethyl)-ethyl, cyclopropyl, methoxy, 4-fluorophenyl, 2,4-difluorophenyl, dimethylamino, formyl-methylamino or isopropylideneamino,

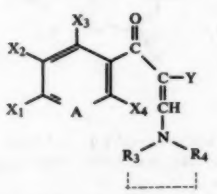
A represents nitrogen or C-R_2, where

R_2 denotes hydrogen, methyl, halogen, nitro, methoxy or cyano,

X_1 and X_2 are identical or different and denote halogen, and

X_3 denotes hydrogen, halogen or nitro and

X_4 denotes halogen, nitro, methoxy or methylthio, which comprises reacting a 3-dialkylamino-2-(het)aroylacrylic acid derivative of the formula



(II)

in which

R_3 and R_4 are the same or different and represent an alkyl group having 1 to 4 carbon atoms or, together with the nitrogen atom to which they are bonded, form a 5- or 6-membered ring which additionally can contain the atoms or groups —O—, —S— or —SO_2—,

with a primary amine of the formula R—NH_2 in the presence of at least one equivalent of an acid HX in a solvent or in excess acid.

5,182,402
HERBICIDAL COMPOSITIONS

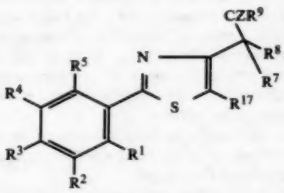
Terence Lewis, Quintilis; Harjinder S. Bansal, Chisbury; Raymond L. Sundley, Mallard; Michael R. Bartley, Lyme Regis; Walter Hepworth, Macclesfield; David J. Gilman, Crowthorne; Ian T. Kay, Mousehole, and David J. Collins, Wokingham, all of Great Britain, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 432,104, Nov. 2, 1989, Pat. No. 5,084,083. This application Sep. 19, 1991, Ser. No. 763,035

Int. Cl.[5] C07D *277/30*

U.S. Cl. 548—204 **8 Claims**

1. A compound of formula (II)



(II)

wherein R^1, R^2, R^3, R^4, and R^5 are independently selected from hydrogen, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, (C_1–C_{10} alkyl)carbonyl, halogen, cyano, nitro, halo-(C_1–C_{10})alkyl and halo-(C_1–C_{10})alkoxy; R^7 is hydrogen, C_1–C_3 alkyl, halo-(C_1–C_{10})alkyl, $C(O)_mR^{10}$ or halogen; wherein R^{10} is hydrogen, C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_2–C_{10} alkynyl or phenyl, any of which may be optionally substituted and m is 1 or 2 R^8 is hydrogen, C_1–C_3 alkyl or halogen or the group R_7 and R^8 together form an oxo group; and the group CZR^9 is carboxy or an ester thereof having the formula $COOR^{15}$ wherein R^{15} is a substituted for alkyl, alkenyl, alkynyl or phenyl groups as defined for R_{10} and R_{15} or substituted C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_2–C_{10} alkynyl or phenyl group and the substituents are one or more groups selected from halogen; hydroxy; C_1–C_6 alkoxy; $C_{(1-6)}$alkoxy$C_{(1-6)}$alkoxy; C_1–C_6 alkoxy substituted by phenyl or naphthyl; nitro; C_3–C_{10} cycloalkyl; a heterocyclic group having a ring of from 3 to 10 atoms containing at least one atom selected from oxygen, nitrogen or sulphur, optionally substituted by oxo; cyano; phenyl optionally substituted by nitro, halo, C_1–C_6 alkoxy or carboxy or salts or C_1–C_6alkyl esters thereof, or C_1–C_{10} alkylsilyl; or R^9 is a group SR^{10} or $NR^{11}R^{12}$ wherein R^{11} is hydrogen or C_1–C_{10}alkyl and R^{12} is hydrogen, optionally substituted C_1–C_{10} alkyl optionally substituted by carboxy or by a C_1–C_3 alkyl carboxylic ester, $S(O)_nR^{10}$, wherein n is 0, 1 or 2, or R^9 is a group $—NR^{11}NR^{13}R^{14}$ wherein R^{11}, R^{13} and R^{14} are independently selected from hydrogen or C_1–C_{10} alkyl; or R^9 is a group $—NR^{11}+NR^{13}R^{14}R^{20}$ X^- wherein R^{11}, R^{13} and R^{14} and R^{20} are each hydrogen or C_1–C_{10} alkyl, and X^- is an agriculturally acceptable anion; Z is oxygen or sulphur and R^{17} is halogen, cyano, nitro, hydroxy, amino or mono or di-C_1–C_{10}) alkylamine.

5,182,403
SUBSTITUTED 3(5'INDAZOLYL) OXAZOLIDIN-2-ONES

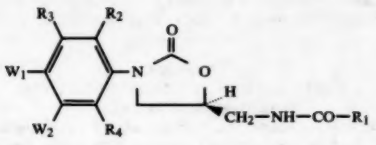
Steven J. Brickner, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 655,419, Feb. 20, 1991, which is a continuation-in-part of Ser. No. 324,942, Mar. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 253,850, Oct. 5, 1988, abandoned, which is a continuation-in-part of Ser. No. 244,988, Sep. 15, 1988, abandoned. This application Apr. 23, 1992, Ser. No. 872,557

Int. Cl.[5] C07D *263/14*

U.S. Cl. 548—231 **5 Claims**

1. A 3-(nitrogen substituted)phenyl-5β-amidomethyl)oxazolidin-2-ones of formula (LV)



(LV)

where

(I) R_1 is —H, C_1–C_4 alkyl, cyclopropyl, —$CHCl_2$, —CCl_3, —O—R_{1-3} where R_{1-3} is C_1–C_4 alkyl, —CH_2OH, —CH_2OR_{1-5} where R_{1-5} is C_1–C_4 alkyl or —CO—R_{1-6} where R_{1-6} is C_1–C_4 alkyl or —ϕ;

(II) two of R_2, R_3 and R_4 are —H and the other of R_2, R_3 and R_4 is —H, —F, —Cl, C_1–C_6 alkyl, —C≡N,

(IIIA) where W_1 and W_2 taken together are

—NR_5—N=CR_6— (XXXII)

where R_5 is —H, C_1–C_{12} alkyl, —$CH_2\phi$, —CH_2CH_2—ϕ, C_3–C_7 cycloalkyl, C_2–C_{12} alkynyl containing 1 triple bond, —CHO, —CO—R_{5-1} where R_{5-1} is

(A) C_1–C_6 alkyl optionally substituted with 1 **13** O—CH_3, —COOH, or 1–3 —Cl,

(B) C_3–C_7 cycloalkyl,

(D) —ϕoptionally substituted with 1–3 —F, —Cl, C_1–C_6 alkyl, —C≡N,

—CO—O—R_{5-8} where R_{5-8} is C_1–C_4 alkyl or —ϕ optionally substituted with 1 or 2 —F, —Cl, C_1–C_6 alkyl, —O—CH_3, —C≡N,

—CO—N(R_{5-9})$_2$ where R_{5-9} is —H or R_{5-8} as defined above —CO—CH_2CN, —CO—CH_2—OH, —CO—CH_2O—ϕ where —ϕ is optionally substituted with 1–3 —O—CH_3,

—CO—CH_2—O—R_{5-10} where R_{5-10} is C_1–C_6 alkyl, —ϕ optionally substituted with 1–3 —O—CH_3, —CO—R_{5-11} where R_{5-11} is C_1–C_6 alkyl, —ϕ optionally substituted with 1–4—F, 1–3 —Cl, 1 —OCH_3, —SO_2CH_3, —SO$_2$—ϕ,

and R_6 is —H and C_1–C_3 alkyl; and pharmaceutically acceptable salts thereof.

5,182,404
BIPHENYL DERIVATIVES, PROCESS FOR PREPARING THE SAME AND INTERMEDIATES THEREFOR

Tameo Iwasaki, Nishinomiya; Kazuhiko Kondo, Osaka; Yuzo Matsuoka, Toyonaka; Mamoru Matsumoto, Nara, and Masaki Sugiura, Kawanishi, all of Japan, assignors to Tanabe Seiyake Co., Ltd., Osaka, Japan

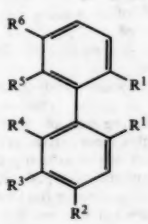
Division of Ser. No. 529,792, May 29, 1990, Pat. No. 5,103,023. This application Jan. 15, 1992, Ser. No. 821,215

Claims priority, application Japan, Jun. 2, 1989, 1-141988

Int. Cl.[5] C07D *263/14*

U.S. Cl. 548—237 **3 Claims**

1. A biphenyl derivative of the formula:



(I)

wherein R^1 is a 4,4-di(lower alkyl)-4,5-dihydro-2-oxazolyl group;

among R^2 to R^4, one of R^2 and R^4 is hydrogen and the

remaining two groups are lower alkoxy groups or both combine to form a lower alkylenedioxy group; and

R^5 and R^6 combine to form a lower alkylenedioxy group.

5,182,405

PREPARATION OF 1,3-DISUBSTITUTED IMIDAZOLIUM SALTS

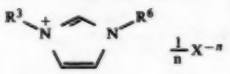
Anthony J. Arduengo, III, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 500,831, Mar. 29, 1990, Pat. No. 5,077,414. This application Sep. 18, 1991, Ser. No. 761,556

Int. Cl.[5] C07D *233/56, 233/58*

U.S. Cl. 548—335.1 **3 Claims**

1. A compound represented by the formula



wherein:

R^3 and R^6 are both n-propyl, isobutyl, or 4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,11-heptadecafluorounde-cyl; or R^3 is methyl and R^6 is n-propyl;

X is an anion; and

n is an integer corresponding to the number of anionic charges on X.

5,182,406

PROCESS AND APPARATUS FOR RECOVERING VEGETABLE FATS AND OILS FROM OIL-CONTAINING NATURAL SUBSTANCES

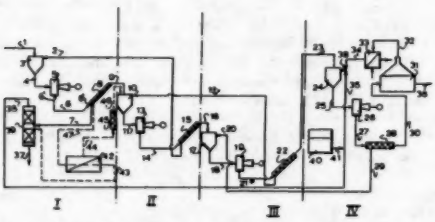
Hubert Coenen, Essen, Fed. Rep. of Germany, assignor to Dorr-Oliver Deutschland GmbH, Grevenbroich, Fed. Rep. of Germany

Continuation of Ser. No. 593,303, Oct. 3, 1990, abandoned, which is a continuation of Ser. No. 254,386, Oct. 5, 1988, abandoned. This application Apr. 5, 1991, Ser. No. 683,501

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1987, 3735458

Int. Cl.[5] C09F *5/02*; C11B *1/00*

U.S. Cl. 554—13 **2 Claims**



1. A process for recovering oil from a natural product selected from the group which consists of oil-bearing seed and oil-bearing fruit, comprising the steps of:

(a) comminuting and conditioning said natural product to facilitate release of oil therefrom;

(b) in a first stage, decomposing the natural product comminuted and conditioned in step (a) in the presence of a solvent capable of solvent-extracting said oil from said natural product and being separable from extracted oil by distillation by subjecting a mixture of the natural product from step (a) and said solvent previously charged with the oil from a successive stage to a conical shear field formed between tool parts projecting toward one another of a rotor and a stator of at least one rotor-stator unit generating a multiplicity of shear actions as said rotor is rotated relative to said stator and said mixture moves outwardly to decompose said natural substance into fine particles and extracting oil into a solvent phase formed by said solvent and the oil extracted thereby;

(c) in said first stage, separating a solid phase from a dispersion of solid particles in said solvent phase;

(d) filtering said solid particles from said dispersion to form a solvent phase free from said particles;

(e) distilling said solvent phase subsequent to filtering in step (d) to yield said oil and a solvent substantially free from said oil;

(f) in a second stage, further decomposing the solid phase separated in step (c) and solid particles filtered in step (d) in the presence of said solvent by subjecting a mixture of solids from steps (c) and (d) and said solvent previously charged with the oil from a successive stage to a conical shear field formed between tool parts projecting toward one another of a rotor and a stator of at least one rotor-stator unit generating a multiplicity of shear actions as the latter rotor is rotated relative to the respective stator and the respective mixture moves outwardly to extracting oil into a the respective solvent;

(g) in said second stage, separating solids from the respective solvent and feeding the respective solvent containing oil to said unit of said first stage;

(h) in a third stage, further decomposing the solids separated in step (g) and subjecting a mixture of solids from step (g) and said solvent previously charted with the oil from a successive stage to a conical shear field formed between tool parts projecting toward one another of a rotor and a stator of at least one rotor-stator unit generating a multiplicity of shear actions as the latter rotor is rotated relative to the respective stator and the respective mixture moves outwardly to extracting oil into the respective solvent;

(i) in said third stage, separating solids from the respective solvent and feeding the respective solvent containing oil to said unit of said second stage; and

(j) in a fourth stage, further decomposing the solids separated in step (i) and subjecting a mixture of solids from step (i) and said solvent from distillation in step (e) to a conical shear field formed between tool parts projecting toward one another of a rotor and a stator of at least one rotor-stator unit generating a multiplicity of shear actions as the latter rotor is rotated relative to the respective stator and the respective mixture moves outwardly to extracting oil into the respective solvent; and

(k) in said fourth stage, separating solids from the respective solvent and feeding the respective solvent containing oil to said unit of said third stage.

5,182,407

SOLUBILIZING AND/OR DISPERSANT COMPOUNDS, PREPARATION PROCESS AND COMPOSITIONS CONTAINING THEM

Henri Sebag, Paris, France, assignor to L'Oreal, France

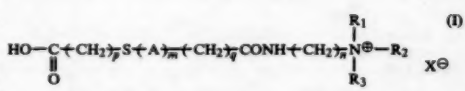
Filed Jul. 17, 1991, Ser. No. 731,441

Claims priority, application France, Jul. 25, 1990, 90 09532

Int. Cl.[5] C09F *5/00, 7/00*; C07C *317/14*

U.S. Cl. 554—52 **7 Claims**

1. Compounds of general formula (I):

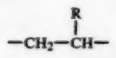


in which:

R_1 and R_2, which are identical or different, denote a methyl or ethyl radical;

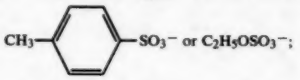
R_3 denotes a methyl, ethyl or hydroxyethyl radical;

A denotes a



radical or

R denotes a hydrogen atom or a methyl radical;
X^- denotes Cl^-, Br^-, I^-, $CH_3OSO_3^-$, $CH_3SO_3^-$,



p and q, which are identical or different, denote integers such that $1 \leqq p \leqq 15$, $0 \leqq q \leqq 13$ and $2 \leqq p+q \leqq 20$;
n denotes an integer equal to 2 or 3;
m denotes 0 or 1, and $m+q \neq 0$;
as well as their salts from neutralisation by bases.

5,182,408

PROCESS FOR PREPARATION OF STABLE AQUEOUS SOLUTIONS OF ZIRCONIUM CHELATES

Sharif Sharif, Midland, Tex., assignor to Zirconium Technology Corporation, Midland, Tex.

Filed Apr. 25, 1991, Ser. No. 691,363
Int. Cl.[5] C07F *7/00*
U.S. Cl. 556—55 **10 Claims**

1. A method of preparing zirconium chelates which comprises

a. reacting ammonium hydroxide, sodium hyroxide, potassium hydroxide, water soluble amines or amine derivatives or alkali metal carbonates or bicarbonates with an alpha hydroxy carboxylic acid to prepare an almost neutral solution of the corresponding alpha hydroxy carboxylic salt;

b. adding said alpha hydroxy carboxylic salt to a solution of zirconium oxychloride, zirconium hydroxy chloride, zirconium acetate or mixtures thereof to form a zirconium chelate.

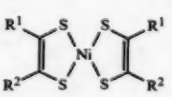
5,182,409

PREPARATION PROCESS OF BIS(1,2-DIARYL-1,2-ETHYOLENEDITHIOLATO)NICKEL-BASED COMPLEX

Keisuke Takuma; Yoshihiro Irizato, and Kimitoshi Katho, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

PCT No. PCT/JP90/00452, § 371 Date Nov. 15, 1990, § 102(e) Date Nov. 15, 1990, PCT Pub. No. WO90/12019, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 4, 1990, Ser. No. 613,554
Claims priority, application Japan, Apr. 5, 1989, 1-84890; Dec. 27, 1989, 1-336608
Int. Cl.[5] C07F *17/02*
U.S. Cl. 556—146 **5 Claims**

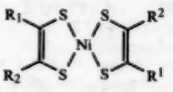
1. A preparation process of bis(1,2-diaryl-1,2-ethylenedithiolato)nickel-based complex represented by the formula (I):



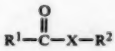
(I)

-continued

and/or



wherein R^1 and R^2 are individually phenyl or naphthyl and may also have from one to three substituents individually selected from alkyl, cycloalkyl, aryl, alkoxy, phenoxy, hydroxy, alkylamino, arylamino, trifluoromethyl, alkylthio, arylthio, nitro, cyano, heterocycle or halogen atoms and these substituents may connect with each other to form a ring, which is characterized by reacting the compound represented by the formula (II):



(II)

wherein R^1 and R^2 are the same as in the formula (I) and X is C=O or CHOH, with phosphorus pentasulfide in 1,3-dimethyl-2-imidazolidinone and successively reacting with nickel chloride.

5,182,410

ORGANO-ALUMINUM HYDROXIDE COMPOUNDS

Chanakya Misra, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 14, 1990, Ser. No. 627,748
Int. Cl.[5] C07F *5/06*
U.S. Cl. 556—187 **110 Claims**

1. A method of preparing a water insoluble crystalline alumino-organic compounds having new characteristic x-ray diffraction patterns which do not correspond to the acid or anhydrous aluminum salt of the acid used and which have a chemical composition expressed in terms of molar ratios, by the formula:

$$M.n[R(COOH)_x]$$

wherein M is aluminum hydroxide, n is the number of moles of organic material reacted with a mole of M, R is an organic functional group and x is equal to or greater than 2, the method comprising reacting a mixture of an aluminum hydroxide material and an organic material in an aqueous solvent, the organic material containing at least two carboxylic acid groups to form said crystalline alumino-organic compound.

54. A water insoluble crystalline anhydrous compound having new characteristic x-ray diffraction patterns which do not correspond to the acid or anhydrous aluminum salt of the acid used and which have a chemical composition expressed in terms of molar ratios, by the formula:

$$M.n[R(COOH)_x]$$

wherein M is a metal hydroxide selected from aluminum hydroxide, n is the number of moles of organic material reacted with a mole of M, R is an organic functional group and x is equal to or greater than 2.

5,182,411

POLYMERIC CHLOROSILAZANES, PROCESS FOR THEIR PREPARATION, CERAMIC MATERIALS CONTAINING SILICON NITRIDE WHICH CAN BE MANUFACTURED THEREFROM, AND THEIR MANUFACTURE

Tilo Vaahs, Kelkheim; Marcellus Peuckert, and Martin Brück, both of Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

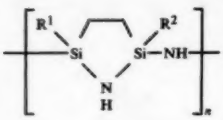
Filed Nov. 30, 1989, Ser. No. 444,681

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1988, 3840775

Int. Cl.[5] C07F 7/10

U.S. Cl. 556—409 9 Claims

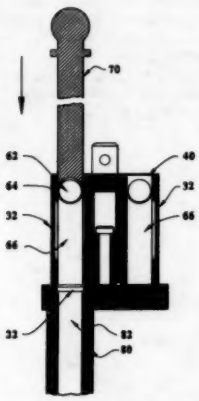
1. A process for the preparation of polymeric chlorosilazanes which comprises reactng a mixture of oligosilazanes of general formula (I)



(I)

in which n is about 2 to about 12, and oligosilazanes of formula (II), $(RSiHNH)_m$, in which m is about 3 to about 12, with at least one of the chlorosilanes $Cl_2R^2Si—CH_2—CH_2—SiR^2Cl_2$, $Cl_3Si—CH_2—CH_2—SiR^3Cl_2$, R^4SiCl_3 or R^5SiHCl_2 at 30° C. to 300° C., where R and R^1 to R^5 are C_2–C_6 alkyl or C_2–C_6 alkenyl groups which can be identical or different.

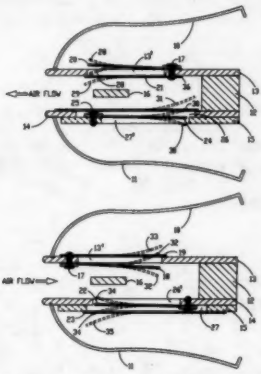
5,182,412
SPEED LOADER FOR MUZZLE-LOADING FIREARMS
Dominick J. Mazza, 20 Hospital St., Carbondale, Pa. 18407
Filed Feb. 4, 1992, Ser. No. 830,818
Int. Cl.[5] F41C *27/00*
U.S. Cl. 42—90 3 Claims



1. An apparatus for loading muzzle-loading firearms, comprising:
(a) a base having upper and bottom surfaces;
(b) a cylinder having a top face, a bottom face, and a vertical face, said bottom face being rotatably mounted to the upper surface of the base and said vertical face being formed with knurls;
(c) said cylinder having a plurality of concentrically located, cylindrical bores extending from the top face to the bottom face of said cylinder, each of said bores having a diameter generally consistent with that of the caliber of the firearm to be loaded;
(d) said cylinder having a plurality of viewing windows located on the vertical face and aligned with each of said cylindrical bores, said viewing windows having painted graduations to indicate the volume of a cylindrical bore as seen through said viewing window;
(e) said base having a through hole generally consistent in diameter with that of said cylindrical bores, said through hole being located to permit alignment with said cylindrical bores, and said through hole being countersunk from the bottom surface with a countersunk hole of diameter generally consistent with that of the outside diameter of the firearm to be loaded;
(f) a coil spring located at the base cylinder mounting to provide rotational resistance in one direction only; and
(g) said bottom face having a plurality of concentrically located detents to releasably engage a spring ball located in said upper surface of said base to provide positive alignment of said cylindrical bores with said through hole.

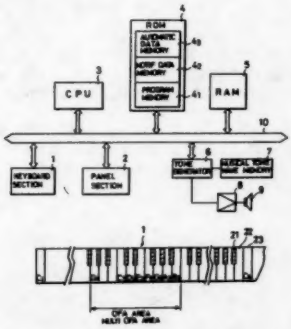
5,182,413
HARMONICA
William R. Epping, 108 N. James St., Ashland, Va. 23005
Filed Aug. 26, 1991, Ser. No. 750,874
Int. Cl.[5] G10D *7/12*
U.S. Cl. 84—377 6 Claims

1. A harmonica comprising:
a multiplicity of adjacent mouthpiece openings;
a draw reed of a first predetermined pitch associated with each of said mouthpiece openings;
a blow reed of a second predetermined pitch associated with each of said adjacent mouthpiece openings which is of a different frequency than said first predetermined pitch of draw reed;
an enabler reed of a third predetermined pitch associated with each of said adjacent mouthpiece openings which is



lower in frequency than said first and second predetermined pitches; and
a valve for said enabler reed
and for said reed which has the higher pitch of said first and second predetermined pitches.

5,182,414
MOTIF PLAYING APPARATUS
Hideki Takahashi, Iwata, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan
Filed Dec. 14, 1990, Ser. No. 628,639
Claims priority, application Japan, Dec. 28, 1989, 1-338132; Jan. 18, 1990, 2-7191; Feb. 1, 1990, 2-20489
Int. Cl.[5] G10H *1/36, 1/40, 7/00*
U.S. Cl. 84—634 5 Claims



1. A motif playing apparatus comprising:
assigning means for assigning arbitrarily-prepared ad-lib motif data to predetermined keys in a predetermined range on a keyboard having a plurality of keys, said ad-lib motif data including a plurality of continuous melody, bass, chord, or rhythm tone data assigned to each of said predetermined keys;
designation means for designating a length of said arbitrarily-prepared ad-lib motif data assigned to a predetermined key by said assigning means;
storage means for storing said arbitrarily-prepared ad-lib motif data having said length designated by said designa-

tion means in association with each of the predetermined keys on said keyboard which are assigned data by said assigning means; and

tone generating means for reading out said arbitrarily-prepared ad-lib motif data from said storage means in association with said predetermined keys assigned by said assigning means and generating associated musical tones.

5,182,415

MUSICAL TONE SYNTHESIZING DEVICE

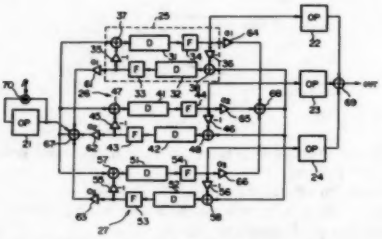
Toshifumi Kunimoto, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Oct. 23, 1991, Ser. No. 781,811

Claims priority, application Japan, Oct. 24, 1990, 2-286831

Int. Cl.[5] G10H *1/08, 1/12*

U.S. Cl. 84—660 **10 Claims**



1. A musical tone synthesizing device comprising:

modulation operation means for generating a modulated musical tone waveform signal in accordance with an inputted modulation signal; and

a waveguide, coupled with said modulation operation means, for generating a signal reciprocating therein, comprising:

delay means for delaying a signal inputted into said waveguide; and

a feed back path for feeding back an output signal of said delay means to an input of said delay means to thereby form a closed loop.

5,182,416

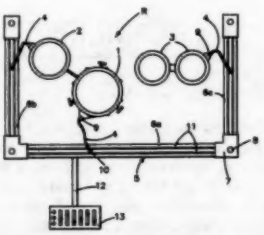
APPARATUS FOR CONNECTING A SET OF PERCUSSION INSTRUMENTS TO A MIXING DESK

Harald Schweizer, 6711 Yucca St. #315, Hollywood, Calif. 90028

Continuation of Ser. No. 575,145, Aug. 29, 1990, abandoned. This application Feb. 3, 1992, Ser. No. 829,395

Int. Cl.[5] G10D *13/02, 15/00;* **G10H** *3/00*

U.S. Cl. 84—723 **7 Claims**



1. An apparatus for electronically connecting a plurality of percussion instruments having individual connecting leads to a mixing desk which comprises: rack means surrounding at least partially the plurality of percussion instruments, said rack means having socket means for electronically connecting the individual connecting leads from each of said percussion instruments to said rack, means and a single connection cable for electronically connecting said rack means to said mixing desk.

5,182,417

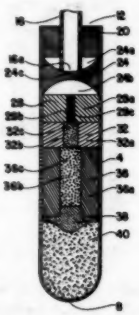
PRECISION DELAY DETONATOR

Daniel C. Rontey, Woodstock; Donald Bigando, Lake Katrine, and Frank Wolfeil, Kingston, all of N.Y., assignors to Ireco, Inc., Salt Lake City, Utah

Continuation of Ser. No. 472,350, Jan. 30, 1990, abandoned. This application Sep. 6, 1991, Ser. No. 759,113

Int. Cl.[5] F42B *3/10*

U.S. Cl. 102—204 **3 Claims**



1. In a delay detonator assembly comprising: (a) a tubular member having a closed end and an open end, (b) a base charge disposed in the closed end of the tubular member, (c) a primary charge disposed adjacent to the base charge and composed of a heat-sensitive explosive composition, (d) a delay charge disposed adjacent to the primary charge and composed of an exothermic-burning composition, (e) a sealer element disposed adjacent to the delay charge comprising a cylinder having a central bore holding a combustible charge for transferring an ignition signal from an ignition source to the delay charge, and (f) the ignition source also disposed in the tubular member near the open end thereof for producing the ignition signal, the improvement comprising:

a transition element separating the sealer element from the ignition source, said transition element comprising a rigid non-combustible annulus having a central bore holding a reactable material, said reactable material comprising lead azide having a burn rate of at least about 0.060 sec./inch or greater and a burn intensity of about 600° C. or greater, packed compactly in said bore into a substantially solid mass and which, when ignited by the ignition signal, develops a substantially constant intensity output for igniting the delay charge.

5,182,418

AIMABLE WARHEAD

James C. Talley, Dahigren, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 21, 1965, Ser. No. 465,806

Int. Cl.[5] F42B *12/02;* **F42C** *13/00*

U.S. Cl. 102—475 **5 Claims**

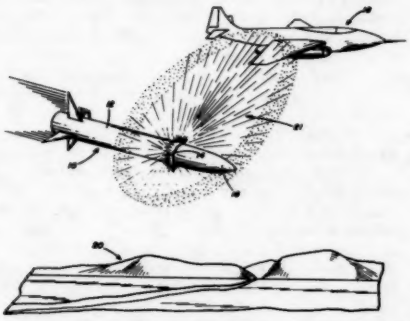
1. An explosive device comprising:

a charge of explosive material;

a plurality of detonators spaced around the periphery of said explosive material; and

a proximity selector means for sensing the location of the

target and thereafter selectively initiating at least one of said detonators opposite the side from which the explosion



is to be directed, whereby the direction of the explosion of said charge may be controlled.

5,182,419

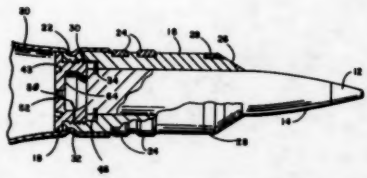
SABOTED PROJECTILE

James E. Burnette, Fullerton, Calif., assignor to ASI Systems International, Orange, Calif.

Continuation-in-part of Ser. No. 389,686, Jun. 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 338,501, Jan. 6, 1982, abandoned, which is a continuation of Ser. No. 1,076, Jan. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 909,922, May 26, 1978, abandoned. This application Feb. 19, 1986, Ser. No. 830,741

Int. Cl.[5] F42B *14/06*

U.S. Cl. 102—523 **5 Claims**



1. A projectile for a conventional ammunition cartridge for firing from a gun having a barrel with a rifled interior surface, said projectile comprising:

an axially symmetric penetrator having a forward end defining a streamlined wind screen and an aft portion defining a circular cylinder of uniform diameter except for a ring groove defined ban exterior surface of the penetrator near but not at the aft end of the penetrator around which an expandable ring is coupled to prevent the penetrator prior to ring expansion from moving either aft or forward in relation to an armored generally axially symmetrical three piece non-disintegrating sabot comprising as the first piece an axially symmetrical forward section defining an interior circular cylindrical surface slightly greater in diameter than the exterior surface of the circular cylinder of the aft portion of the penetrator, the exterior surface of the forward section increasing in diameter as a function of distance from the forward end of the forward section to a strong bourrelet which prevents wearing away of sabot material which wearing away would cause balloting in the barrel, the exterior surface of the first piece defining at least one portion of greater diameter which mates with grooves of a gun barrel to prevent loss of a substantial amount of gas around the sabot during firing, the portion of greater diameter being fabricated from a material softer than the gun barrel rifling so that said soft portion of greater diameter can be engraved by the grooves of the gun barrel without damaging the rifling grooves, the aft portion of the first piece of the sabot having an exterior surface with at least one indentation capable of removably mating with the forward portion of the casing of a conventional ammunition cartridge, the forward interior surface of the axially symmetrical first piece of the sabot adjacent that portion of the penetrator forward of the penetrator ring groove defining an interior circular cylinder of diameter slightly greater than the diameter of the penetrator, the second piece of the sabot comprising the expandable ring of exterior diameter when not expanded slightly greater than the diameter of the penetrator, and an interior diameter when expanded slightly greater than the exterior diameter of the penetrator and the third piece of the sabot is an armored threaded end cap attached to a rear portion of the first piece by a threaded connection, said end cap having a forward part and an aft part and an interior surface defining an axially symmetrical cylindrical cavity, the cavity opening via an axially symmetrical hole having a smaller diameter than the cylindrical cavity to a rear surface of the end cap and the forward part having an exterior surface defining left threading thereon which is coupled to the aft end of the first piece which has an interior surface defining left handed threading mating with the threading of the end cap to hold the sabot and penetrator together prior to firing, the aft end of the first piece having an interior surface approximately equal to but slightly greater than the exterior surface of the expanded ring in diameter and coupled to the end cap, the cylindrical cavity in the end cap is in contact with the rear end of the projectile, the sabot having a geometry and mass distribution such that its actual gyroscopic stability factor is equal to or greater than that required for achieving stable flight along a substantially predictable and repeatable trajectory, the ring expanding and permitting the penetrator to separate from the sabot during rotation in a rifled barrel during firing so that the penetrator separates from the sabot after leaving the barrel when the force of acceleration on the sabot from firing diminishes sufficiently to permit the non-disintegrating sabot to decelerate backwards from the relative position of the penetrator, wherein the sabot does not disintegrate near the gun muzzle.

5,182,420

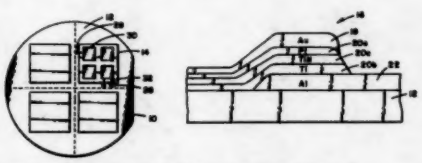
METHOD OF FABRICATING METALLIZED CHIP CARRIERS FROM WAFER-SHAPED SUBSTRATES

Richard R. Steitz, Chippewa Falls; Diane M. Christie, Eau Claire; Eugene F. Neumann, Chippewa Falls; Melvin C. August, Chippewa Falls, and Stephen Nelson, Chippewa Falls, all of Wis., assignors to Cray Research, Inc., Eagan, Minn.

Continuation-in-part of Ser. No. 343,506, Apr. 25, 1989. This application Apr. 9, 1990, Ser. No. 506,729

Int. Cl.[5] H01L *23/02*

U.S. Cl. 174—52.4 **21 Claims**



1. An integrated circuit chip carrier, comprising:

(a) a ceramic substrate having a cavity formed on a first surface for receiving an integrated circuit chip; and

(b) at least one conductive thin film trace deposited on said first surface of said substrate being comprised of a first homogeneous metal deposited on said substrate, a barrier metallurgy deposited on said first homogeneous metal and

a second homogeneous metal deposited on said barrier metallurgy.

5,182,421

PRINTED WIRING BOARD WITH TEST PATTERN FOR THROUGH HOLES

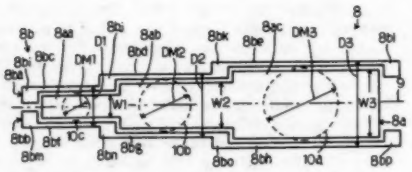
Yoshitaka Mouri, Toyama, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 3, 1992, Ser. No. 845,019

Claims priority, application Japan, Mar. 11, 1991, 3-43914

Int. Cl.[5] H05K *1/00*

U.S. Cl. 174—250 **5 Claims**



1. A printed wiring board comprising

a) a board member having a major surface virtually broken down into a first zone and a second zone, at least one through-hole being open at said first zone of said major surface, said at least one through-hole having a first predetermined diameter; and

b) an electrically conductive test pattern formed on said second zone of said major surface, and having a first conductive sub-pattern and a second conductive sub-pattern spaced apart from each other by a first predetermined gap, a first test hole of said first predetermined diameter being formed in said first conductive sub-pattern in such a manner as to split said first conductive sub-pattern into two disconnected pieces without breakage of said second conductive sub-pattern in so far as said first predetermined diameter is matched with a design specification.

5,182,422

ELECTRIC SWITCH, ESPECIALLY FOR OPERATING A WINDSHIELD WIPER AND WASHER SYSTEM OF A MOTOR VEHICLE

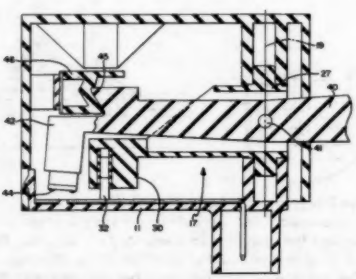
Jakob Botz, Ingersheim; Georg Hofmann, Heilbronn-Horkheim, and Adam Weber, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric, Bietigheim-Bissengen, Fed. Rep. of Germany

Filed May 28, 1991, Ser. No. 706,455

Claims priority, application Fed. Rep. of Germany, May 25, 1990, 4016773

Int. Cl.[5] H01H *9/00*

U.S. Cl. 200—61.54 **13 Claims**



3. An electric switch for operating a windshield wiper and washer system for a motor vehicle comprising:

a switch housing assembly having a plurality of electrically isolated, stationary contacts;

a switching member mounted in said switch housing for rotation about a first axis into switch positions interconnecting separate pairs of said plurality of stationary contacts and corresponding to operational stages of said windshield wiper system;

a switch lever mounted on said switching member for rotation about a second axis angularly offset from said first axis; and

a first bridging contact carried by said switch lever for alternatively bridging one pair of said plurality of stationary contacts depending upon the angular position of said switch lever about said second axis, said first bridging contact bridging said one pair of stationary contacts, thereby activating said washer system, at different points as a function of the angular position of said switching member and said switch lever about said first axis so that said alternative bridging of said one pair of said stationary contacts by said first bridging contact is independent of said position of said switching member and said switch lever about said first axis.

5,182,423

ELECTRIC SWITCH FOR OPERATING A WINDSHIELD WIPER AND WASHER SYSTEM OF A MOTOR VEHICLE

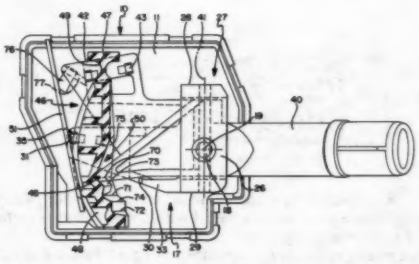
Jakob Botz, Ingersheim; Georg Hofmann, Heilbronn-Horkheim, and Adam Weber, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric, Bietigheim-Bissengen, Fed. Rep. of Germany

Filed May 24, 1991, Ser. No. 705,222

Claims priority, application Fed. Rep. of Germany, May 25, 1990, 4016772

Int. Cl.[5] H01H *9/00*

U.S. Cl. 200—61.54 **19 Claims**



7. An electric switch for operating a windshield wiper and washer system of a motor vehicle comprising:

a switch housing in which a switching member for operating the wiper system in a selected operation mode is swivelably mounted about a first axis for movement from a neutral position into at least one operational position;

a switch lever for operating the washer system swivelably mounted on the switching member and movable from a neutral position into an operational position around a second axis intersecting the first axis, wherein in a first position of the switching member, the switch lever, when swivelled around the second axis into an operational position, is swivelable, together with the switching member, compulsorily around the first axis at least to such an extent that, at least after being released, the switch lever together with the switching member reaches a second position of the switching member.

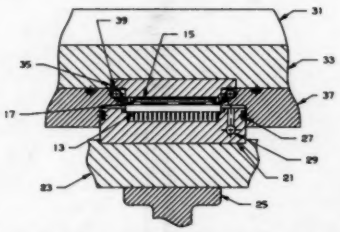
8. The electric switch according to claim 7, further comprising a ramp with a slope, the ramp with a slope engaging the switch lever, when the switch lever is swivelled around the second axis, and generating a torque acting on the switch lever to swivel the switch lever around the first axis.

5,182,424

MODULE ENCAPSULATION BY INDUCTION HEATING

Vlastimil Frank, Rte. 4, Box 113, Warrenton, Va. 22186

Filed Oct. 31, 1989, Ser. No. 429,889
Int. Cl.[5] B23K *13/02*
U.S. Cl. 219—10.53 7 Claims



1. A method of encapsulating a ceramic substrate having at least one semiconductor chip joined thereon with a protective cap through the use of RF induction heating to melt a sealband placed in contact with said substrate and said cap near the periphery of said cap, comprising the steps of:

positioning said cap over said substrate so that said sealband is in contact with said cap near its periphery;

placing said cap and said substrate in a substantially airtight chamber;

forcing said cap and said substrate together to promote a good bond between said cap and said substrate, simultaneously forcing said cap in thermal contact with said sealband;

inducing a current in said cap with an electromagnetic field in an RF spectrum, said electromagnetic field concentrated at said cap near its periphery to reduce effects of said electromagnetic field on circuitry on said substrate and chip and to reduce power requirements, thereby heating said cap by induction heating and said sealband melts; and,

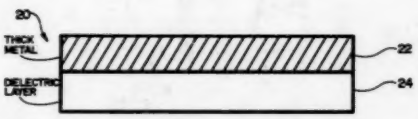
creating air pressure within said chamber to prevent heated air within said cap from breaching said molten sealband until said sealband cools and solidifies.

5,182,425

THICK METAL MICROWAVE SUSCEPTOR

Peter S. Pesheck, Minneapolis, and Ronald R. Lentz, Plymouth, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Nov. 6, 1990, Ser. No. 609,910
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E 32 Claims



27. A microwave susceptor structure, comprising:

an electrically thick metal layer having a thickness of at least approximately three skin depths; and

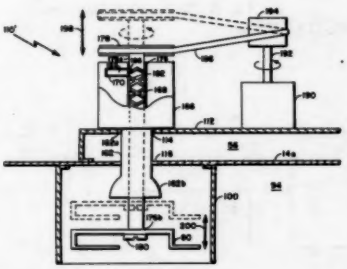
a dielectric layer, coupled to the electrically thick metal layer, the dielectric layer having an impedance that sufficiently matches a first impedance corresponding to the electrically thick metal layer to a wave impedance corresponding to a microwave having a frequency in a range of 2300 to 2600 Megahertz so that a controlled amount of power transmitted by the microwave is coupled into the electrically thick metal layer.

5,182,426

MICROWAVE OVEN HAVING AN IMPROVED ANTENNA

John B. Sklenak, Sudbury, and Joseph C. Maiellano, Jr., Chelmsford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 17, 1991, Ser. No. 809,459
Int. Cl.[5] H05R *6/72*
U.S. Cl. 219—10.55 F 10 Claims



1. A microwave oven comprising:

a cooking cavity;

an antenna positioned within said cooking cavity;

means, including a waveguide, for exciting said antenna with microwave energy; and

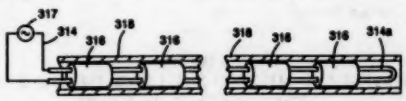
means for rotating said antenna and simultaneously cycling said antenna through a vertical excursion.

5,182,427

SELF-REGULATING HEATER UTILIZING FERRITE-TYPE BODY

Thomas H. McGaffigan, Half Moon Bay, Calif., assignor to Metcal, Inc., Menlo Park, Calif.

Filed Sep. 20, 1990, Ser. No. 586,865
Int. Cl.[5] H05B *6/10*
U.S. Cl. 219—10.75 42 Claims



1. A self-regulating heating device having a ferrite-type body having a Curie temperature, Tc, the device comprising:

central conductor means for carrying a high frequency alternating current and producing a magnetic field around the exterior thereof;

a power supply connected to the central conductor means for supplying the high frequency alternating current to the conductor means at sufficient power to cause the ferrite-type body to heat by internal losses to its Curie temperature; and

said ferrite-type body positioned in the magnetic field of the central conductor means and being sufficiently lossy to be capable of producing sufficient heat by internal losses in said magnetic field to raise the temperature of the ferrite-type body to Tc;

whereby the heating device self-regulates at Tc when powered by said power supply at a sufficiently high frequency and at sufficient power to cause the ferrite-type body to heat to Tc by internal losses.

5,182,428

METHOD AND APPARATUS FOR REMOVING TARGET SECTIONS OF SHEET METAL FROM A CONTINUOUS COIL AND PLACING THOSE SECTIONS IN SEPARATE CONTINUOUS COILS IN A CONTINUOUS OPERATION

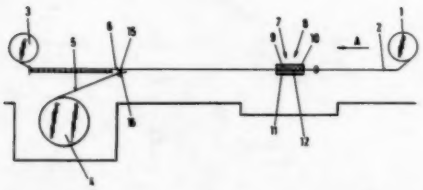
Kurt K. J. Jäck, Aulendorf, and Gerhard G. A. Alber, Ravensburg, Fed. Rep. of Germany, assignors to Thyssen Industries AG Maschinenbau, Fed. Rep. of Germany

Filed Mar. 11, 1991, Ser. No. 667,752

Claims priority, application European Pat. Off., Apr. 6, 1990, 90106963.6

Int. Cl.[5] B23K *26/00*; B21D *39/03*

U.S. Cl. 219—121.63 **32 Claims**



21. An apparatus for selectively separating target sections from a continuous coil of original sheet metal and connecting those sections onto separate continuous coils of target sheet metal, comprising:

an original coil containing said original sheet metal;

an elongated table spaced from said original coil for receiving said sheet metal drawn from said coil;

a pair of clamping jaws attached to said table and capable of clamping onto said drawn sheet metal;

a sensor displaced along said table for detecting target sections within said drawn sheet metal;

means mounted on said table between said pair of jaws for cutting said sheet metal immediately prior to said target section;

first winder means spaced from said original coil for drawing said cut sheet metal;

a second winder spaced from said original coil and said first winder and containing said continuous target sections;

means mounted on said table between said clamping jaws for joining said continuous target sections to the detected target section on said original sheet metal; and,

means for winding upon said second winder said detected target section.

5,182,429

SYSTEM AND METHOD FOR LASER WELDING THE INNER SURFACE OF A TUBE

William E. Pirl, Levelgreen; Edward H. Smith, Brave; Charles H. Roth, Jr., N. Huntingdon; Rodney A. Lutz, Penn Township, Westmoreland County, and John J. Anderson, Gibsonia, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 23, 1991, Ser. No. 705,050

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.63 **25 Claims**

1. A system for laser welding the inner wall of a conduit, comprising:

1) an elongated tubular housing having a distal portion and proximal portion;

2) a fiber-optic cable means for conducting remotely generated laser light into said tubular housing:

3) a beam deflection mechanism supported within said housing and including a rotating reflecting means for radially directing and focusing light received from said fiber-optic cable means around the inner wall of a conduit, and

4) a tracking assembly mounted on said tubular housing for maintaining a constant radial distance between the reflecting means of the deflection mechanism and the inner wall of said conduit despite irregularities in the roundness of said wall to maintain the focus of said beam against said conduit wall, wherein said reflecting means has a front portion that emanates said beam and wherein said tracking

assembly includes a follower means for spacing the front portion of the reflecting means a constant radial distance from said conduit wall, and a means for radially biasing the follower means against the inner wall of the conduit as said reflecting means rotates.

5,182,430

POWDER SUPPLY DEVICE FOR THE FORMATION OF COATINGS BY LASER BEAM TREATMENT

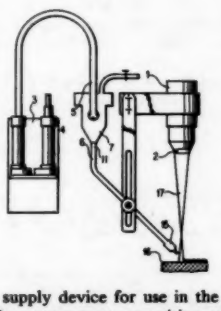
Georges L. Lagain, Combs la Ville, France, assignor to Societe National d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Oct. 10, 1991, Ser. No. 774,782

Claims priority, application France, Oct. 10, 1990, 90 12479

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.63 **4 Claims**



1. A powder supply device for use in the formation of a coating by laser beam treatment, comprising a powder dispensing apparatus for supplying the powder with a carrier gas, a delivery pipe for conducting said carrier gas and powder from said dispensing apparatus, an expansion chamber connected to said delivery pipe to receive said carrier gas and powder therefrom, said expansion chamber having an inlet pipe for conducting said carrier gas and powder into said chamber, a powder diffuser carried by said inlet pipe, a conical part and an outlet pipe connected thereto for the passage of Powder from said expansion chamber, and an exhaust pipe for the escape of

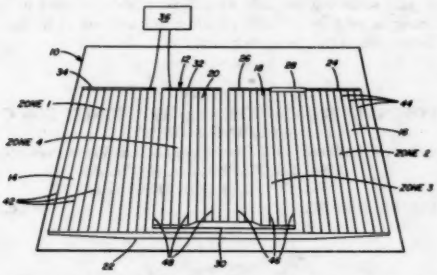
carrier gas from said expansion chamber disposed in a face of said chamber opposite said outlet pipe, said exhaust pipe being fitted with a flow regulator, and said outlet pipe being fitted with a nozzle for the discharge of powder at the end thereof remote from said expansion chamber.

5,182,431

ELECTRICALLY HEATED WINDOW

Harry S. Koontz, Pittsburgh, and John P. Forr, Altoona, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 18, 1991, Ser. No. 809,113
Int. Cl.[5] H05B *3/06*
U.S. Cl. 219—203 **13 Claims**



1. An electrically heated window comprising four electrical resistance heating elements, each of said heating elements having an upper and lower bus bar positioned along top and bottom edge portions of said window and a plurality of electrically conducting resistive filaments extending therebetween, wherein a first heating element generally defines a first outer heatable zone generally at one end of said window, a second heating element generally defines a second outer heatable zone generally at the other end of said window, a third heating element generally defines a first central heatable zone generally adjacent to and inboard of said second heatable zone and a fourth heating element generally defines a second central heating zone positioned between said first and third heatable zones, and further wherein said lower but bar of said first heating element is connected to said lower bus bar of said second heating element, said upper bus bar of said second heating element is connected to said upper bus bar of said third heating element and said lower bus bar of said third heating element is connected to said lower bus bar of said fourth heating element, and a first electrical connecting means connected to said upper bus bar of said first heating element and a second electrical connecting means connected to said upper bus bar of said fourth heating element generally in close proximity to said first connecting means, said resistive filaments of said heating elements being configured to provide a heating system geometry for said heated window which produces more rapid heating in said third and fourth heating elements than in said first and second heating elements.

5,182,432

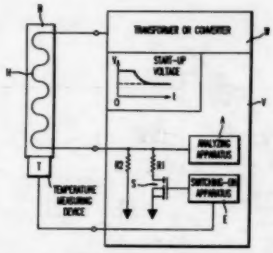
CRACK DETECTOR AND HEATING CIRCUIT FOR MOTOR VEHICLE HEADLIGHT LIGHT TRANSMISSIVE SHIELD

Ulrich V. Lange, Erwitte; Wolfgang Daub, Lippstadt, and Friedrich-Karl Wendt, Salzkotten, all of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed May 13, 1991, Ser. No. 698,958
Claims priority, application Fed. Rep. of Germany, May 14, 1990, 4015399
Int. Cl.[5] H05B *41/29, 1/02;* F21M *7/00;* B60S *1/56*
U.S. Cl. 219—202 **8 Claims**

1. A circuit arrangement for a motor vehicle headlight of a type including a reflector and/or a lens, a light source coupled to a voltage-source device, an enclosing light-transmissive shield, at least one electrically conducting heating element on or in the light-transmissive shield, a switching-on apparatus for the heating element;

wherein, the heating element is electrically coupled with an analyzing apparatus, the analyzing apparatus includes a light-transmissive-shield-crack monitoring means for detecting cracks in the light-transmissive shield which comprises a current or voltage measuring device, the light



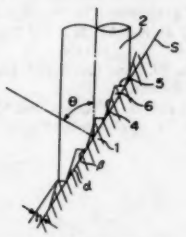
source is a high pressure gas discharge lamp, the voltage-source device being a power supply of the high pressure gas discharge lamp, and the switching-on apparatus and the analyzing apparatus are parts of the power supply of the high pressure gas discharge lamp for controlling power provided by the power supply to the conducting heating element and the high pressure gas discharge lamp in response to measurements of the light-transmissive shield-crack monitoring means.

5,182,433

METHOD OF LASER QUENCHING

Hiroki Sakamoto; Hidenobu Matsuyama, and Kimihiro Shibata, all of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Oct. 22, 1991, Ser. No. 780,500
Claims priority, application Japan, Dec. 12, 1990, 2-401506
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.85 **4 Claims**



1. A method of laser transformation hardening adapted to irradiate a laser beam in a sense of P polarization on a work piece at an angle of incidence to a surface of the work piece of 60° or more which comprises steps of:

forming a plurality of triangular ridges on a horizontal plane adjacent to a surface of the work piece, having a first plurality of inclined surfaces inclined at a first angle to the horizontal plane and a second plurality of inclined surfaces inclined at a second angle to the horizontal plane, the first angle being smaller than the second angle; and

irradiating the laser on the work piece at the angle of incidence to the surface of the work piece of 65° to 70° from a direction on the side of the second plurality of inclined surface.

5,182,434

LASER BEAM MACHINING METHOD

Yoshinori Nakata, Minamitsuru, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

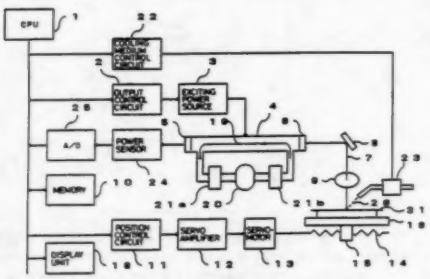
PCT No. PCT/JP90/01098, § 371 Date Apr. 25, 1991, § 102(e) Date Apr. 25, 1991, PCT Pub. No. WO91/04124, PCT Pub. Date Apr. 4, 1991

PCT Filed Aug. 29, 1990, Ser. No. 684,930

Claims priority, application Japan, Sep. 19, 1989, 1-243013

Int. Cl.[5] B23K *26/00, 26/14*

U.S. Cl. 219—121.72 **3 Claims**



1. In a laser beam machining method of processing a machining path having an acute angle in a CNC laser machining apparatus, the laser beam machining method comprising:

previously reading a machining program, to thereby detect that the acute angle of the machining path is not greater than a preset allowable angle;

moving a workpiece for cutting to the vertex of the acute angle under normal machining conditions;

automatically stopping the application of a laser beam when said vertex is reached;

ejecting a cooling medium for a predetermined time;

drilling the workpiece under set drilling conditions after the passage of said predetermined time; and

continuing the cutting work under the normal cutting conditions.

5,182,435

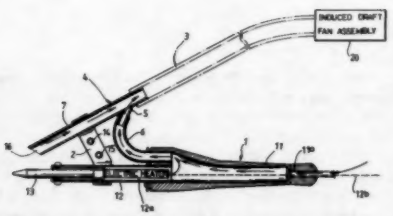
ELECTRIC SOLDERING IRON WITH FORKED SUCTION PIPE FOR REMOVING SOLDERING SMOKE AND COOLING THE HANDLE OF THE SOLDEREING IRON

Chiou-Liang Wang, 19, Lane 156, Sec. 1, Ling-Yun Rd., Wu-Ku Village, Taipei, Taiwan

Filed Feb. 4, 1992, Ser. No. 831,106

Int. Cl.[5] B23K *3/00;* **H05B** *3/00*

U.S. Cl. 219—230 **2 Claims**



1. In an electric soldering iron of the type comprising a hollow casing including a hand-hold portion at one end and a soldering bit at an opposite end, said bit being supported by a tubular electric heater holder longitudinally aligned between the bit and the casing and holding an electric heater therein permitting said soldering bit to be heated by said electric heater for the process of soldering, the improvement comprising a suction pipe holder securing a forked suction pipe having a pair of intake ports and an outlet port to said electric heater holder, wherein said suction pipe holder is made from a curved plate secured to said electric heater holder by screw means; said forked suction pipe is comprised of a main pipe defining one of said intake ports at one end and said outlet port at its other end and a branch pipe connected at one end to said main pipe and having a second end defining the other intake port, the forked pipe being secured to said suction pipe holder by screw means with said outlet port thereof being connected to an induced-draft fan assembly through a flexible air pipe, said other intake port of said suction pipe being connected to said hand-hold portion of said hollow casing by a heat-resisting hose and said one of said intake ports being disposed adjacent to said soldering bit, said hand-hold portion of said hollow casing having an air inlet to allow ambient air to be drawn therethrough by the suction pipe.

5,182,436

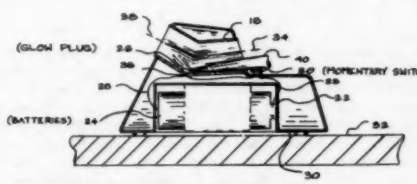
PORTABLE BENCH-TYPE ELECTRIC IGNITE FOR GAS WELDING TORCHES

Gilbert J. Polidoro, 4222 Touchstone Ct., Las Vegas, Nev. 89108

Filed Jul. 19, 1991, Ser. No. 732,625

Int. Cl.[5] F23Q *7/00;* **H05B** *3/00*

U.S. Cl. 219—262 **9 Claims**



1. A portable gas torch igniter, comprising:

a) a housing having a flame duct formed therein for the introduction of a gas torch;

b) a glow plug secured to a surface of said flame duct;

c) an electric power source for providing an electric current to said glow plug, said power source comprising a battery; and,

d) electrical connection means including an electrical switch attached to said housing for conducting electric current between said power source and said glow plug, said electrical switch being positioned so as to switch on when a tip of said welding torch is positioned in proximity to said glow plug,

wherein said flame duct is open at its rear end and has a front portion arranged substantially horizontally and has an open front end into which the torch tip can be inserted, and wherein a rear portion of said flame duct is directed upwardly at an angle in the range between 35 degrees and 55 degrees for directing the resulting flame up and away from the rear of said torch igniter.

5,182,437

FLAME-TYPE HEATER PLUG FOR AN AIR-COMPRESSION FUEL-INJECTION INTERNAL-COMBUSTION ENGINE

Friedrich Schmid; Peter Joppig, both of Korb, and Roland Klak, Ostfildern, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Feb. 21, 1991, Ser. No. 658,676

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1990, 4010093

Int. Cl.[5] H05B *3/00;* **F23Q** *7/00;* **F02P** *19/02*

U.S. Cl. 219—270 **12 Claims**

1. Flame-type heater plug for an air-compression fuel-injection internal-combustion engine, comprising:

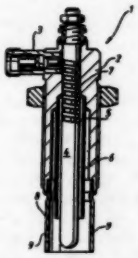
a plug housing,

a proportioning insert provided for the fuel supply and located on the plug housing,

a heating bar having one end extending into and secured in the plug housing and having a free end extending outwardly of the plug housing,

an evaporator tube arranged spaced along a substantial portion of the length of the plug housing from the proportioning insert and surrounding the heating bar to form an annular interspace therebetween with the free end of the heating bar projecting from the evaporator tube,

a flame tube connected with the plug housing and disposed to surround the end of the evaporator tube from which the



heating bar extends and to surround the portion of the heating bar extending therefrom, said flame tube adapted to be disposed in the flow path of intake air flowing in a suction tube of an internal-combustion engine when in an in-use position, said flame tube including passage orifices for passage of intake air into the interior of the flame tube,

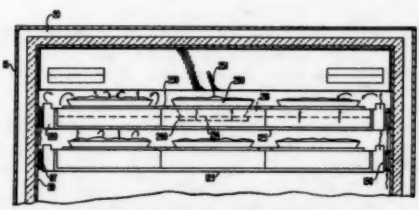
and a fuel connection in said plug housing between the proportioning insert and the evaporator tube, wherein said fuel connection includes a helical swirl channel opening into the annular interspace and located between the plug housing and the portion of the heating bar extending into the plug housing, wherein the swirl channel is formed on an outer surface of the heating bar.

5,182,438

FOOD SERVICE APPARATUS AND PROCESS

Roger K. Oakes, Nashville, and Kevin B. Cundiff, Brentwood, both of Tenn., assignors to Aladdin Synergetics, Inc., Nashville, Tenn.

Filed Jan. 11, 1990, Ser. No. 463,471
Int. Cl.[5] H05B *3/68*
U.S. Cl. 219—386 **46 Claims**



1. A food preparation apparatus comprising:

a chamber;

an electrical terminal mounted on said chamber;

a first removable heat transfer element disposed in said chamber;

means for supporting said first heat transfer element, said supporting means removably received in said chamber and including:

means for releasably electrically connecting said supporting means to said terminal; and

means for distributing power from said electrical connection means to said first heat transfer element;

a second heat transfer element disposed on said supporting means and releasably electrically connected to said first heat transfer element such that said first heat transfer element remains on said supporting means when said second heat transfer element is removed from said supporting means; and

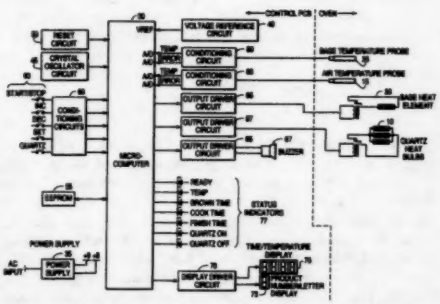
said first heat transfer element includes means for releasably electrically connecting to said power distribution means.

5,182,439

METHOD AND APPARATUS FOR OPERATING A FOOD OVEN

Doug Burkett, and Gary L. Mercer, both of Eaton, Ohio, assignors to Henny Penny Corporation, Eaton, Ohio

Filed Aug. 19, 1991, Ser. No. 748,200
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—412 **17 Claims**



1. A method for operating a food oven having first and second heating elements comprising:

(a) selecting a duration for each of a first, a second, and a third heating interval;

(b) selectively setting said first heating element to be activated during any of the first, second, and third heating intervals;

(c) activating said second heating element during each of the first, second, and third intervals;

(d) automatically activating said first heating element responsive to step (b); and

(e) adjusting the duration of any said interval that said first heating element is selectively activated based upon at least one of an oven air temperature, a load compensation factor, and a base temperature set point.

5,182,440

PROCESS AND CONNECTION COMPONENT USING AN ELECTRICAL RESISTOR FOR THE WELDING OF PLASTIC ELEMENTS

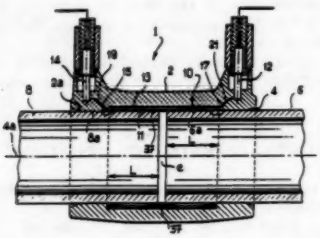
Denis Dufour, Deuil La Barre, and Francois Fortin, Paris, both of France, assignors to Gaz de France, Paris, France

Filed Nov. 27, 1990, Ser. No. 618,408
Claims priority, application France, Nov. 29, 1989, 89 15706
Int. Cl.[5] H05B *3/58*
U.S. Cl. 219—535 **13 Claims**

1. A process for joining a connection component together with at least one other component by welding, each of said connection component and said at least one other component comprising a body made of a heat-fusing plastic, said process comprising:

placing opposite one another contiguous surfaces of said connection component and said at least one other component, said contiguous surfaces defining a welding zone;

providing said connection component with a resistive foil of electrically conductive material for the circulation of a current in said welding zone, said resistive foil being embedded in said connection component and being capable of splitting at a temperature substantially equal to a predetermined welding temperature;



circulating an electrical current through said resistive foil for heating said components to said welding temperature;

splitting said resistive foil in response to said temperature, said splitting of said resistive foil causing an interruption of said electrical current, whereby said electric current is terminated when said welding temperature exists in said welding zone.

5,182,441

INSTANT PORTABLE BAR CODE READER

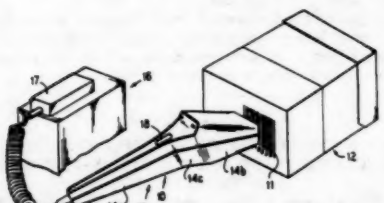
George E. Chadima, Jr., Cedar Rapids, Iowa, and Vadim Laser, Cincinnati, Ohio, assignors to Norand Corporation, Cedar Rapids, Iowa

Continuation of Ser. No. 492,427, Mar. 6, 1990, abandoned, which is a continuation of Ser. No. 418,884, Oct. 10, 1989, abandoned, which is a division of Ser. No. 339,953, Apr. 18, 1989, Pat. No. 4,894,523, which is a continuation of Ser. No. 234,880, Aug. 19, 1988, abandoned, which is a division of Ser. No. 827,286, Feb. 7, 1986, Pat. No. 4,766,300, which is a continuation of Ser. No. 637,693, Aug. 6, 1984, Pat. No. 4,570,057, which is a continuation of Ser. No. 334,811, Dec. 28, 1981, abandoned. This application Nov. 13, 1990, Ser. No. 613,954

The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.

Int. Cl.[5] G06F *7/10*

U.S. Cl. 235—472 **23 Claims**



1. In portable bar code reader system,

(a) a hand-held bar code reader having an elongated hand grip portion for grasping in the hand of a user, and having a reader head portion connected with said elongated hand grip portion and having longitudinally spaced forward and rearward ends,

(b) said elongated hand grip portion having a length and cross sectional configuration so as to be grasped by the hand with the fingers in gripping relation thereto,

(c) said hand-held bar code reader having a window to be directed toward a bar code to be read and providing for transmission of light between the interior and exterior of said reader head portion,

(d) a light source in said reader head portion for producing visible light energy which is directed outwardly through said window for illuminating the bar code in a bar code sensing region in front of said reader head portion,

(e) a photodetector positioned within said reader head portion for sensing visible light reflected from the bar code located within said bar code sensing region, so as to generate a bar code signal representing the illuminated bar code,

(f) said reader head portion having a first light path of the visible light energy therein from said light source to said window and a second light path therein from said window to said photodetector, and having an optical system positioned in said second light path between said window and said photodetector for receiving visible light from the bar code in said bar code sensing region during a bar code reading operation, said optical system defining at least a point of reflection rearwardly of said window which reflects the visible light of the bar code along said second light path onto said photodetector which generates said bar code signal representing the illuminated bar code while said reader head portion is substantially spaced from the bar code and free of any contact with the bar code carrier, and without requiring any movement of said hand-held bar code reader as a whole to effect the bar code reading operation, said second light path comprising a first portion extending from said window towards said rearward end to said point of reflection and a second portion,

(g) a printed circuit board in said hand-held bar code reader for mounting said photodetector in a fixed relationship thereon, and circuitry on said printed circuit board connected with said photodetector for transmitting successive bar code signals generated by said photodetector, and

(h) a unitary mounting framework within the interior of said hand-held bar code reader and having said printed circuit board secured therewith, said unitary mounting framework mounting said optical system within said reader head portion such that said second portion extends from said point of reflection towards said forward end at least as far as a region proximate to said forward end of said reader head portion to render said reader head portion compact in the longitudinal direction between said ends in comparison to the length of said second light path within the interior of said reader head portion, said unitary mounting framework together with said printed circuit board supporting said photodetector and said optical system in optically aligned relationship and providing for positioning thereof as a unitary subassembly within the interior of said reader head portion.

5,182,442

LOW POWER CONSUMPTION NON-CONTACT INTEGRATED CIRCUIT CARD

Kenichi Takahira, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1990, Ser. No. 564,851

Claims priority, application Japan, Mar. 13, 1990, 2-59928

Int. Cl.[5] G06K *19/07*

U.S. Cl. 235—492 **4 Claims**

1. A non-contact IC card comprising:

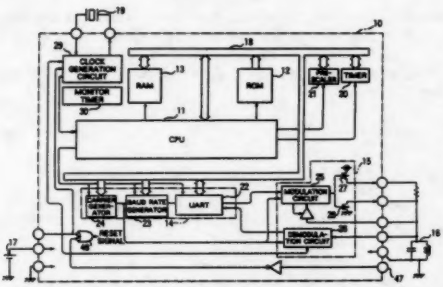
data transmit-receive means including an antenna for transmitting a response signal to and receiving trigger and request signals from a terminal unit, a modulation circuit for modulating response signals for transmission form said antenna, and a demodulation circuit for demodulating trigger and request signals received through said antenna, said modulation and demodulation circuits being connected to said antenna, said demodulation circuit including detection means for discriminating between a trigger

signal having a first magnitude in signals received through said antenna by said data transmit-receive means;

data memory means for storing data;

data processing means connected to said data memory means and to said data transmit-receive means for processing data stored in said data memory means in response to a request signal and for outputting a response signal based on the data processing;

clock signal generating means for generating and supplying a clock signal to said data processing means, connected to said data processing means and said data transmit-receive means and including actuating means for actuating said clock signal generating means when said detection means



detects a trigger signal in a signal received by said data transmit-receive means through said antenna, wherein said clock signal generating means includes a clock signal generating circuit having first stop means for stopping generation of the clock signal by said clock signal generating means after (i) actuation of said clock signal generating means by said actuating means, (ii) data processing by said data processing means, said (iii) output of a response signal by said data processing means to the terminal unit through said data transmit-receive means and said antenna; and

a battery for supplying electrical power to said data transmit-receive means, data memory means, data processing means, and clock signal generating means.

5,182,443

OPTICAL APPARATUS HAVING VISUAL AXIS DETECTOR AND DETERMINING WHETHER EYEGLASSES ARE WORN

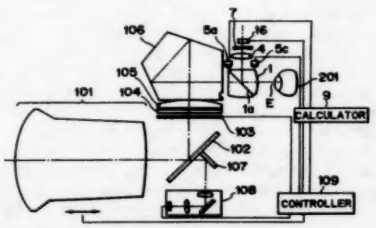
Yasuo Suda, Yokohama; Akihiko Nagano, Kawasaki, and Kazuki Konishi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1991, Ser. No. 767,665

Claims priority, application Japan, Sep. 29, 1990, 2-260840; Sep. 29, 1990, 2-260841

Int. Cl.[5] G03B *13/02, 29/00;* G01V *9/04*

U.S. Cl. 250—201.2 **15 Claims**



1. An optical apparatus comprising:

a view finder through which a subject is observed;

a visual axis detection means for detecting a direction of a visual axis of an observer who is looking into said view finder; and

a determination means for determining whether or not the observer is wearing eyeglasses.

5,182,444

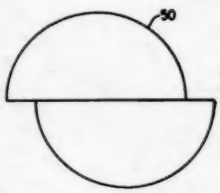
SPLIT LENS DISPLACED LONG FROM EACH OTHER ALONG PLANE OF CUT

James W. Howard, Natick, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 365,243, Jun. 12, 1989, Pat. No. 4,987,292. This application Oct. 31, 1990, Ser. No. 606,101

Int. Cl.[5] G02B *3/00*

U.S. Cl. 250—201.5 **4 Claims**



1. A method of manufacturing a split lens, comprising:

providing a lens

sawing said lens into two halves, which are complete but for the kerf of the saw, along a plane containing the optical axis, and

mounting said lens halves joined together at the plane of the cut and displaced from each other along the plane of the cut in order to avoid offset effects.

5,182,445

CONTACT TYPE LINE IMAGE SENSOR

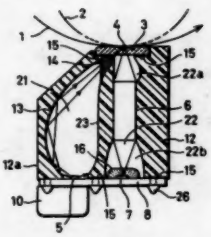
Hiromi Yamashita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 13, 1991, Ser. No. 668,566

Claims priority, application Japan, Jul. 9, 1990, 2-181239

Int. Cl.[5] G01J *1/04*

U.S. Cl. 250—208.1 **5 Claims**



1. A contact type line image sensor, comprising:

a case having a light source space and a separate image reading space located therewithin;

a transparent plate mounted at one end of said case and having a read surface from which original image information is read from an original document pressed against said read surface;

a light source and a reflecting mirror surface provided within said light source space, said reflecting mirror surface reflecting light from said light source to said read surface of said transparent plate;

an IC sensor element and a rod lens array provided within said image reading space, said rod lens array focusing light from read surface onto said IC sensor element for convert-

ing light image information into electrical image information;

a partitioning wall constituting a barrier between said light source space and said image reading space formed within said case; and

said partitioning wall further including a light guide for condensing light from said reflecting mirror surface to said read surface of said transparent plate.

5,182,446

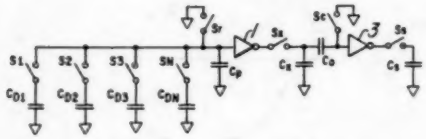
CIRCUIT WITH RESET NOISE CANCELLATION

Claude E. Tew, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 3, 1991, Ser. No. 770,684

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **14 Claims**



1. A low noise reset circuit which comprises:

(a) a preamplifier having input and output terminals;

(b) a first capacitor coupled between said input terminal and a source of reference potential;

(c) a second capacitor coupled between said output terminal and said source of reference potential;

(d) a switch coupled between said output terminal and said second capacitor coupling said output terminal to said second capacitor in response to a first predetermined signal; and

(e) a third capacitor coupled between the junction of said switch and said second capacitor and a circuit output terminal.

5,182,447

PHOTOELECTRIC CONVERTING APPARATUS WITH MAXIMUM AND MINIMUM ACCUMULATION DETECTING

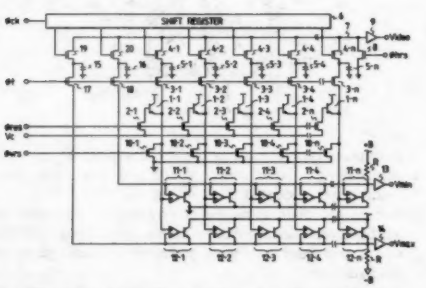
Toshiki Nakayama, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1990, Ser. No. 616,211

Claims priority, application Japan, Nov. 22, 1989, 1-301818

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **12 Claims**



1. A photoelectric converting apparatus comprising:

a plurality of photoelectric conversion elements for accumulating charges which were photoelectrically converted within a predetermined time;

a common output amplifier;

at least one of maximum value detecting means for detecting a maximum accumulation signal of one of said photoelectric conversion elements into which a strongest light impinges and minimum value detecting means for detecting a minimum accumulation signal of one of said photoelectric conversion elements into which a weakest light impinges; and

reading means for reading out the maximum accumulation signal obtained from said maximum value detecting means or/and the minimum accumulation signal obtained from said minimum detecting means through said common output amplifier.

5,182,448

PHOTOCOUPLER WITH IMPROVED ANTI-NOISE CHARACTERISTICS

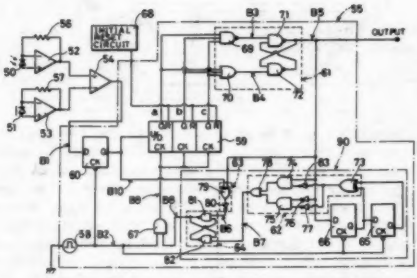
Yoshihiro Ohtsuka, Nara, and Yoshifumi Masuda, Kashihara, both of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Sep. 24, 1991, Ser. No. 764,923

Claims priority, application Japan, Oct. 5, 1990, 2-268668; Jun. 12, 1991, 3-140077

Int. Cl.[5] G08C *21/00*

U.S. Cl. 250—214 B **16 Claims**



1. A photocoupler which has a light generating section for converting an input signal into light and a light receiving section for converting the light from the light generating section into a signal and releasing the signal after having the signal subjected to a delay until at least the input signal becomes stable, comprising: light receiving means for receiving light from the light generating section; converting means for switching an output thereof from Low to High upon receipt of light by the light receiving means;

oscillating means for generating a clock signal;

an updown counter for counting the clock signal within 0 and a preset number, and switching an operation thereof between counting-up mode and counting-down mode according to an output of the converting means;

decoder means for switching an output thereof from Low to High when a counted value of the updown counter reaches a preset number after the updown counter started a counting-up operation in response to a first level change from Low to High of the output of the converting means; keeping the output thereof High until the preset number is counted down to "0" after the updown counter started a counting-down operation in response to a second level change from High to Low of the output of the converting means; switching the output thereof from High to Low when the counted value equals to zero; and forming an output of the photocoupler as its own output; and

clock signal supply control means for supplying a clock signal to the updown counter since the first level change until a full-count state of the updown counter; and supplying the clock signal again to the updown counter since the second level change until the full-count value of the updown counter is counted down to "0",

wherein the light receiving means, the converting means, the oscillating means, the updown counter, the decoder

means and the clock signal supply control means are monolithically integrated.

5,182,449

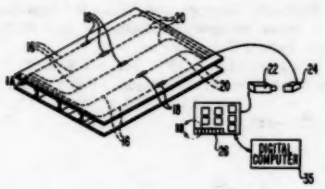
SYSTEM AND METHOD FOR STRUCTURAL MONITORING USING OPTICAL IMAGING OF FIBER SENSORS

Allan H. Johnson, Derby, Kans., and Donald A. Woodbridge, San Ramon, Calif., assignors to The Boeing Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 475,861, Feb. 6, 1990, abandoned. This application Feb. 26, 1991, Ser. No. 660,258

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.14 **22 Claims**



1. A sensor system for a structure comprising:
a light source;
a plurality of means coupled to said light source for guiding optical signals;
a plurality of optical sensors integral with the structure and respectively coupled to said guiding means, said sensors being adapted to modulate respective ones of said optical signals in response to stimuli from the structure;
a plurality of means for directing the modulated optical signals;
an optical detector coupled to said plurality of directing means, said detector being adapted to form a video image; and
means coupled to said optical detector for processing the formed image.

5,182,450

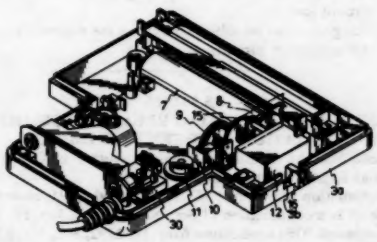
HANDHELD IMAGE SCANNER WITH AUTOMATIC MOVEMENT CONTROL

Ampere Pan, Taipei, Taiwan, assignor to Primax Electronics Ltd., Taipei, Taiwan

Filed Nov. 6, 1991, Ser. No. 788,499

Int. Cl.[5] H01J *3/14;* **H04H** *1/024*

U.S. Cl. 250—234 **10 Claims**



1. A handheld image scanner, comprising:
a housing;
a light source mounted to a bottom side of said housing for emitting light to illuminate an image being scanned;
a horizontal line scanning means provided inside said housing and including a transducer means to receive light signals which correspond to an illuminated horizontal line portion of the image, said transducer means generating an electric signal which varies according to the intensity of light signals received;
a transverse distance detecting means including a roller means which rolls along the surface of the image when said image scanner is moved in a direction transverse to the illuminated horizontal line portion, a transmission means provided inside said housing and capable of being rotatably driven by said roller means, and a signal generating means activated by said transmission means so as to generate a series of ON/OFF signals which are indicative of the transverse distance traversed by said image scanner; and
a driving unit having a motor means with an output shaft, said driving unit being capable of rotatably driving said transmission means so as to rotate said roller means and automatically move said image scanner in the direction transverse to the illuminated horizontal line portion, said driving unit being selectively engageable with said transmission means.

5,182,451

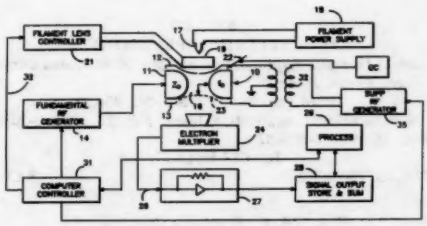
METHOD OF OPERATING AN ION TRAP MASS SPECTROMETER IN A HIGH RESOLUTION MODE

Jae C. Schwartz; John E. P. Syka, and John N. Louris, all of Santa Clara County, Calif., assignors to Finnigan Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 693,808, Apr. 30, 1991, abandoned. This application Mar. 12, 1992, Ser. No. 849,970

Int. Cl.[5] H01J *49/42*

U.S. Cl. 250—282 **14 Claims**



1. The method of operating anion trap mass spectrometer in the high resolution mode comprising the steps of defining a trap volume with a three-dimensional substantially quadrupole field for trapping ions within a predetermined range of mass-to-charge ratio, forming or injecting ions within said trap volume such that those within said predetermined mass-to-charge ratio range are trapped, applying a supplementary AC field superimposed on said three-dimensional quadrupole field to form combined fields, scanning said combined fields to resonantly eject ions of consecutive mass-to-charge ratio from said trap volume for detection characterized in that
said supplementary field has an amplitude just sufficient to eject said ions, and
said combined fields are scanned at a rate so that a length of time corresponding to 200 cycles or more of the supplementary AC field occurs per consecutive thomson.

5,182,452

METHOD FOR DETERMINING THE PRESENCE OF THIN INSULATING FILMS

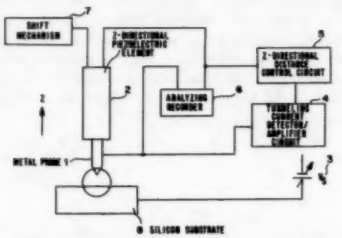
Masaaki Niwa, Hirakata, and Shozo Okada, Kobe, both of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Continuation of Ser. No. 552,983, Jul. 16, 1990, abandoned. This application Oct. 15, 1991, Ser. No. 776,852

Claims priority, application Japan, Jul. 17, 1989, 1-184088; Feb. 21, 1990, 2-39952

Int. Cl.[5] H01J *37/00*

U.S. Cl. 250—307 **3 Claims**



1. A method for determining the presence of an insulating film on the surface of an electrically conductive material as a specimen, comprising the steps of:

bringing an electrically conductive probe and said electrically conductive material sufficiently close to that electron clouds smearing out around surface atoms included in said electrically conductive probe and electron clouds smearing out around surface atoms included in said electrically conductive material are corrected together;

applying a voltage between the probe and the surface of said electrically conductive material sufficient to establish a tunneling current; and

detecting and amplifying said tunneling current which flows through said probe, while controlling the distance between the probe and the surface of the electrically conductive material to ensure that said tunneling current is substantially constant.

5,182,453

ION SCATTERING SPECTROMETER

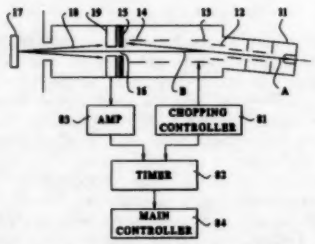
Shigeki Hayashi, Kyoto, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Feb. 18, 1992, Ser. No. 836,384

Claims priority, application Japan, Feb. 22, 1991, 3-103681; Feb. 22, 1991, 3-103682

Int. Cl.[5] H01J *37/252*

U.S. Cl. 250—309 **8 Claims**



5. An ion scattering spectrometer for irradiating ions onto a sample and measuring the energy of ions scattered backward by the sample, the ion scattering spectrometer comprising:

a) an ion source for ejecting ions along a first axis;

b) a deflector for deflecting ions having a predetermined mass and electric charge toward a second axis which intersects the first axis;

c) an aperture plate placed intersecting the second axis and having an aperture at the intersecting point for allowing the ions deflected by the deflector to be irradiated onto the sample and preventing other ions;

d) a pair of chopping electrodes for intermittently allowing the ions to pass through the aperture;

e) a detector for detecting ions scattered backward by the sample; and

f) a timer for measuring the time for which the ions fly from the chopping electrodes to the detector.

5,182,454

SCANNING ELECTRON MICROSCOPE

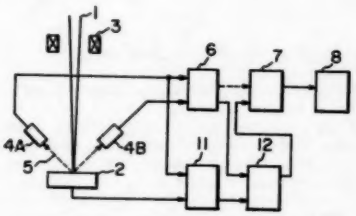
Hiroshi Matsuda, Kawagoe, and Michitaka Suzuki, Akishima, both of Japan, assignors to JEOL Ltd. and JEOL Technics Co. Ltd., both of Tokyo, Japan

Filed Mar. 2, 1992, Ser. No. 844,250

Claims priority, application Japan, Mar. 5, 1991, 38491

Int. Cl.[5] H01J *37/28*

U.S. Cl. 250—310 **2 Claims**



1. A scanning electron microscope comprising:

an electron gun emitting an electron beam to the surface of a specimen;

a means for scanning the electron beam on the specimen surface;

two detectors arranged in such a way as to detect electron beams produced in two directions which are substantially symmetrical with respect to the normal line to the specimen surface;

a subtractor circuit producing the difference between the output signals from the detectors;

a current detector detecting the electrical current absorbed by the specimen;

a corrective circuit which multiplies the output signal from the subtractor circuit by the output value from the current detector to correct the output signal from the subtractor circuit; and

an integrator circuit which integrates the output signal from the corrective circuit.

5,182,455

METHOD OF DETECTING RELATIVE POSITIONAL DEVIATION BETWEEN TWO OBJECTS

Masato Muraki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 767,361, Sep. 30, 1991, abandoned, which is a continuation of Ser. No. 468,601, Jan. 19, 1990, abandoned. This application May 11, 1992, Ser. No. 884,303

Claims priority, application Japan, Jan. 20, 1989, 1-011294

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—548 **27 Claims**

1. A method, usable with first and second objects placed at respective sites which are substantially conjugate with each other with respect to a projection lens system and with respect to a predetermined wavelength, for detecting a positional deviation between the first and second objects with respect to

a direction perpendicular to an optical axis of the projection lens system, said method comprising the steps of:

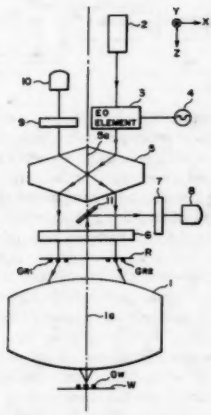
forming first and second grating marks of the first object and forming a third grating mark on the second object;

spacing apart the first and second grating marks of the first object by a distance related to axial chromatic aberration of the projection lens system with respect to a difference between the predetermined wavelength and a wavelength different from the predetermined wavelength;

irradiating the first and second grating marks with first and second radiation beams, each having wavelengths different from the predetermined wavelength;

superposing, through the projection lens system, a first diffraction beam produced by the first grating mark as a result of the irradiation and a second diffraction beam produced by the second grating mark as a result of the irradiation, upon one another on the third grating mark to form a beam spot thereat;

causing interference between a first twice-diffracted beam produced as a result of diffraction of the first diffraction beam by the third grating mark in superposing step, and a second twice-diffracted beam produced as a result of diffraction of the second diffraction beam by the third grating mark in said superposing step, to produce an interference beam, wherein the interference beam has an intensity which is variable with a positional relationship between the beam spot and the third grating mark with respect to the perpendicular direction and said irradiating step comprises periodically changing phase difference between the first and second radiation beams, to thereby modulate the intensity of the interference beam;



detecting a relative positional deviation between the first and second objects with respect to the perpendicular direction, on the basis of the detection of the interference beam;

causing third and fourth reflection beams produced as a result of regular reflection of the first and second radiation beams by the first and second grating marks, respectively, to interfere with each other to form a reference interference beam; and

detecting the formed reference beam to produce a reference signal having a predetermined phase,

wherein in said detecting step the interference beam is converted into a signal and, on the basis of a phase difference between the obtained signal and the reference signal, any relative positional deviation of the first and second objects is detected.

5,182,456

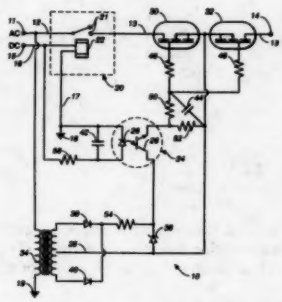
NOISE ATTENUATING CIRCUIT FOR MECHANICAL RELAY INCLUDING OPTICAL ISOLATION

Dale L. Beezley, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1992, Ser. No. 841,606

Int. Cl.[5] G02B *27/00*

U.S. Cl. 250—551 **1 Claim**



1. An electrical noise attenuating circuit, disposed to connect to a normally-open electro-mechanical relay having mechanical relay contacts and a relay coil, the relay contacts being electrically connected to an AC input terminal by a relay input lead and to an AC output terminal by a relay output lead, the relay coil being electrically connected to a DC input terminal by a coil input lead and to a common ground by a coil ground lead, said noise attenuating circuit comprising:

at least two field effect transistors having gates, connected together in series and disposed to be inserted into the relay output lead between the relay contacts and the AC output terminal;

rectifying means for producing a rectified voltage-stabilized direct current, disposed to be electrically connected between the relay input lead and the common ground;

coupling means for providing electrically isolated coupling to the relay coil circuit, including a light-emitting diode and a photo-transistor, said photo-transistor being electrically connected by a first lead to the rectified direct current output of said rectifying means;

current delay means for delaying the rise of current in said light-emitting diode, electrically connected to said light-emitting diode and disposed to connect to the coil input lead and to the coil ground lead; and

voltage delay means for delaying the rise of voltage applied to the gates of said field-effect transistors, electrically connecting with said field-effect transistors and with a second lead of said phototransistor and with a floating ground of said rectifying means.

5,182,457

DEVICE FOR PHOTO-ELECTRICALLY MONITORING A MOVING YARN USING TWO SENSOR HEADS

Karl Hagmann, Emmenbrücke, Switzerland, assignor to Rhone-Poulenc Viscosuisse SA, Emmenbrucke, Switzerland

PCT No. PCT/CH91/00003, § 371 Date Aug. 26, 1991, § 102(e) Date Aug. 26, 1991, PCT Pub. No. WO91/10898, PCT Pub. Date Jul. 25, 1991

PCT Filed Jan. 7, 1991, Ser. No. 752,638

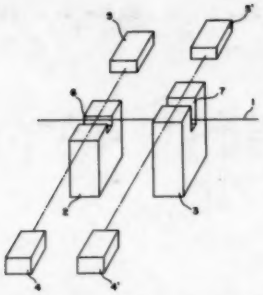
Claims priority, application Switzerland, Jan. 12, 1990, 102/90

Int. Cl.[5] G01N *21/88*

U.S. Cl. 250—572 **6 Claims**

1. A device for photo-electrically monitoring a moving yarn (1) for irregularities, consisting of sensor heads connected in series in the direction of yarn movement, in which a beam

transmitter (4) and a beam receiver (5) are aligned with a first sensor head (2) and a beam transmitter (4') and a beam receiver (5') are aligned with a second sensor head (3), thereby characterized in that the first sensor head (2) is equipped with a recess



(6) and the second sensor head is equipped with a recess (7), where the cross-sectional depth of the recess (7) of the second sensor head (3) is greater than the recess (6) of the first sensor head (2).

5,182,458

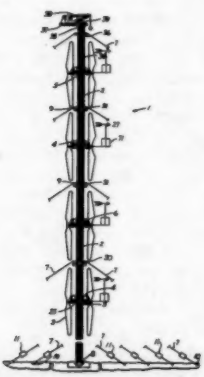
EFFICIENT HIGH TOWER WIND GENERATING SYSTEM

Harry R. McConachy, 2/9 David St Balaclava, Melbourne, Vic, Australia 3183

Continuation of Ser. No. 735,319, Jul. 24, 1991, Pat. No. 5,146,096, and a continuation-in-part of Ser. No. 542,578, Jun. 25, 1990, Pat. No. 5,062,765. This application Mar. 12, 1992, Ser. No. 850,992

Int. Cl.[5] F03D *9/00*

U.S. Cl. 290—55 **10 Claims**



1. A high altitude electric power generating system comprising in combination, a single column tower of significant height divided into a plurality of mast sections articulated at joints between the sections of the mast along its height, said mast being constructed to bear significant vertical and lateral weight loads contributed by said generating system distributed along the height of the mast, a plurality of vertically disposed rotor driven electric generators mounted on different ones of said articulated mast sections at different mast heights, and means comprising guy wire means coupled in the vicinity of the joints to tensioning means for maintaining the tower vertically while dynamically tilting individual ones of said articulated mast sections independently over a narrow angle from vertical in response to lateral wind induced forces on said rotor driven generators.

5,182,459

CONTROL SYSTEM FOR VEHICLE SAFETY DEVICE

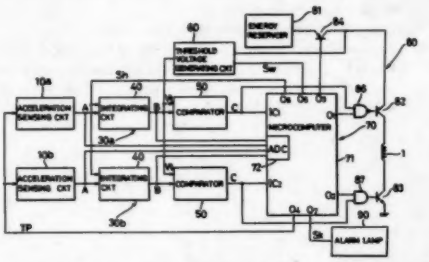
Masami Okano, and Kunihiro Takeuchi, both of Higashimatsuyama, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Jan. 18, 1991, Ser. No. 642,951

Claims priority, application Japan, Feb. 7, 1990, 2-25942

Int. Cl.[5] B60R *21/32, 21/00*

U.S. Cl. 307—10.1 **8 Claims**



1. A control system for a vehicle safety device, comprising:

(a) an acceleration sensing circuit which produces an output;

(b) an analog collision detection system including an integrating circuit for integrating the output of said acceleration sensing circuit, and a comparator circuit for comparing an output of said integrating circuit with a threshold level so as to detect a collision of a vehicle;

(c) a digital collision detection system including an analog-to-digital converter for converting the output of said acceleration sensing circuit into digital data, and a microcomputer, said microcomputer comprising (i) collision detection means for performing calculations in accordance with said digital data from said analog-to-digital converter, so as to detect the vehicle collision; (ii) test pulse generating means for outputting test pulses to said acceleration sensing circuit; and (iii) malfunction detection means for checking at least one of the output of said integrating circuit of said analog collision detection system and an output of said comparator circuit so as to detect a malfunction of said analog collision detection system, the outputs of said integrating circuit and said comparator circuit being produced in response to said test pulse; and

(d) a drive circuit which operates said vehicle safety device when said drive circuit simultaneously receives collision detections signals respectively from both of said analog and digital collision detection systems;

wherein the output of said acceleration sensing circuit produced in response to said test pulse has a polarity opposite to that of the output of said acceleration sensing circuit produced during vehicle collision with respect to a reference voltage; and

wherein the outputs of said acceleration sensing circuit and said integrating circuit are maintained at the reference voltage when the vehicle is stopped or is running at a constant speed, and the output of said integrating circuit produced in response to said test pulse has a polarity opposite to that of the output of said integrating circuit produced during vehicle collision with respect to the reference voltage.

5,182,460

METHOD AND APPARATUS TO REGULATE ILLUMINATION RANGE OF A MOTOR VEHICLE

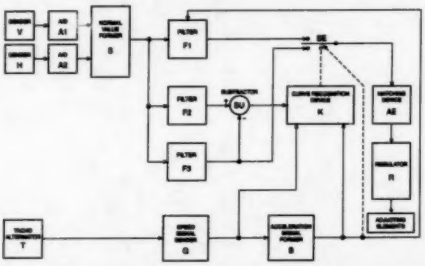
Micha Hussman, Lippstadt, Fed. Rep. of Germany, assignor to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Jul. 30, 1991, Ser. No. 737,720

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1990, 4024916

Int. Cl.[5] B60Q *1/076, 1/08, 1/10*

U.S. Cl. 307—10.8 **11 Claims**



7. Apparatus for regulating the illumination range of a motor vehicle with a front axle sender and a rear axle sensor sender which produces signals in dependance upon the position of a motor-vehicle body to the front axle and the rear axle, said apparatus having a nominal-value developer which develops a difference between signals from the front axle sender and the rear axle sender, with at least one first filter which carries out an averaging of the difference nominal value and with a regulator which, in dependance upon the filtered nominal value, regulates positions of adjusting elements for adjusting the illumination range of the motor vehicle, said apparatus further including the improvement: that the nominal-value developer is coupled with first filter having a first filter time constant; that the nominal-value developer is coupled with a second filter having a second, short, filter time constant; that the nominal- value developer is coupled with a third filter having a third, long, filter time constant; that the first filter or the third filter can be coupled via a switchover device with the regulator; that the second filter and the third filter are coupled with a subtractor; that the subtractor is coupled with a curve recognition device; and that the curve recognition device, upon the presence of a difference between the signals from the second filter and the third filter, controls the switchover device so that the third filter is coupled with the regulator and upon termination of the difference so that the regulator is again coupled with the first filter.

5,182,461

SWITCHING MECHANISM FOR APPLIANCE CONTROLLER

Michael Baran, Wauwatosa, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 28, 1990, Ser. No. 589,856

Int. Cl.[5] H01H *3/42, 43/10*

U.S. Cl. 307—41 **12 Claims**

1. A programmable switching array comprising:

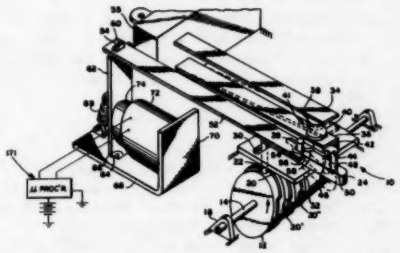
(a) at least one electrical switching means each having a set of contacts with one contact movable for making and breaking electrical contact therebetween;

(b) cam means adapted to be cyclically driven;

(c) follower means having a pivotable condition and a floating condition, and operable in said pivotable condition to be pivoted about a fulcrum by said cam means and effect said making and breaking of said set of contacts;

(d) latchable means having a latched condition and an unlatched condition, and operable in said latched condition to provide said fulcrum for said follower means, and operable in said unlatched condition to enable said follower means floating condition;

(e) actuator means operable for upon electrical energization and de-energization to move said latchable means between said latched condition and said unlatched condition; and,



(g) circuit means, including microcomputer means, operable to energize and de-energize said actuator means in a preprogrammed sequence.

5,182,462

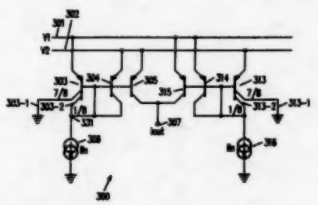
CURRENT SOURCE WHOSE OUTPUT INCREASES AS CONTROL VOLTAGES ARE BALANCED

Michael E. Wright, Berkeley, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Mar. 3, 1992, Ser. No. 845,312

Int. Cl.[5] B60T *17/18;* **H03K** *5/01*

U.S. Cl. 307—43 **2 Claims**



1. A circuit comprising:

a first power input lead of a first polarity;

a second power input lead of said first polarity;

a third power input lead of a second polarity;

an output lead for providing an output current;

a first current mirror circuit comprising:

a first transistor having a first current handling lead coupled to said first power supply lead, a second current handling lead coupled to said third power supply lead, a third current handling lead coupled to said third power supply lead, and a control lead coupled to said third current handling lead;

a second transistor having a first current handling lead coupled to said second power supply lead, a second current handling lead coupled to said control lead of said first transistor, and a control lead coupled to said control lead of said first transistor; and

a third transistor having a first current handling lead coupled to said second power supply lead, a second current handling lead coupled to said output lead, and a control lead coupled to said control lead of said first transistor; and

a second current mirror circuit comprising:

a fourth transistor having a first current handling lead coupled to said second power supply lead, a second current handling lead coupled to said third power supply lead, a third current handling lead coupled to said

third power supply lead, and a control lead coupled to said third current handling lead;

a fifth transistor having a first current handling lead coupled to said first power supply lead, a second current handling lead coupled to said control lead of said first transistor, and a control lead coupled to said control lead of said fourth transistor; and

a sixth transistor having a first current handling lead coupled to said first power supply lead, a second current handling lead coupled to said output lead, and a control lead coupled to said control lead of said fourth transistor.

5,182,463

3-PHASE CONVERTER APPARATUS

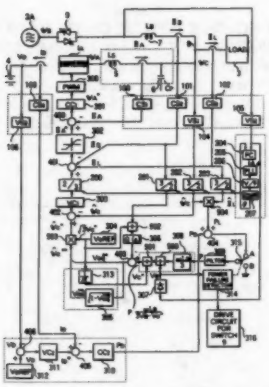
Yuushin Yamamoto; Nobuo Sashida; Yuuko Yamasaki, and Takao Kawabata, all of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1990, Ser. No. 543,478

Claims priority, application Japan, Jun. 29, 1989, 1-165399

Int. Cl.[5] H02J *3/32*; H02M *3/24*

U.S. Cl. 307—46 **15 Claims**



1. A 3-phase converter apparatus in which a 3-phase A.C. power supply and a 3-phase converter operate in parallel on a common load BUS so as to share load power, said apparatus comprising:

output voltage command generating means for generating an output voltage command of output voltage from the converter, said means computing an optimum phase deviation of a load BUS voltage from the A.C. power supply and determining the output voltage command in accordance with a computed value of the optimum phase deviation; and

instantaneous voltage control means for controlling the converter so as to reduce deviation of the instantaneous value of the output voltage of the converter from the output voltage command generated by said output voltage command generating means.

5,182,464

HIGH SPEED TRANSFER SWITCH

George K. Woodworth, Gainesville, and Forrest K. Smith, Nokesville, both of Va., assignors to Techmatics, Inc., Arlington, Va.

Filed Jan. 9, 1991, Ser. No. 639,070

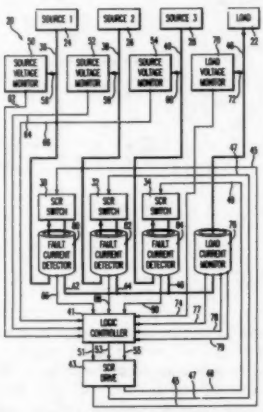
Int. Cl.[5] H02J *3/10*

U.S. Cl. 307—87 **49 Claims**

1. A high speed transfer switch for transferring a multiphase load between first and second multiphase A.C. power sources, comprising:

switching means for selectively connecting each phase of said load to the corresponding phase of said first or second power source;

load current monitoring means for detecting a zero current condition in each phase of said load; and



control means coupled to said switching means and to said load monitoring means, said control means being responsive to a detected transfer condition to cause said switching means to independently transfer each phase of the load from the first power source to the second power source immediately upon detection of a zero current condition in said phase by said load current monitoring means.

5,182,465

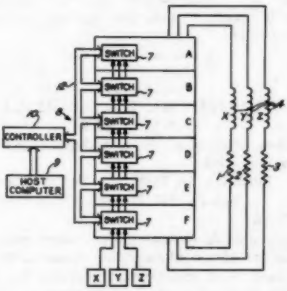
AMPLIFIER SELECTOR FOR MAGNETIC RESONANCE IMAGING MACHINE

Gerald R. Stanley, Osceola, Ind., assignor to Crown International, Inc., Elkhart, Ind.

Filed Jan. 23, 1990, Ser. No. 469,090

Int. Cl.[5] H01H *67/00*

U.S. Cl. 307—115 **12 Claims**



1. A selector for connection to a gradient amplifier having signal input terminals and power output terminals, said selector including multiple switch means for selectively connecting said amplifier input terminals to one of a plurality of voltage sources and said power output terminals to one of a plurality of loads, said multiple switch means including a plurality of rotatable non-conductive plates, each of said plates having a conductive pad on each side, a plurality of first fixed in location

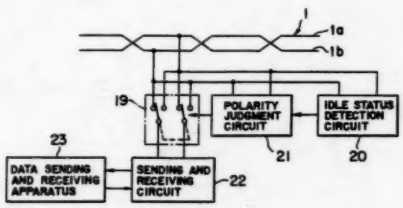
contacts positioned about each of said plates, said contacts being operatively associated with a plurality of output terminals of said voltage sources and adapted for connection to said amplifier output terminals, said first fixed contacts being slidably engagable with a said pad on one side of said plates, a plurality of second fixed in location contacts positioned about each of said plates, said second fixed contacts being operatively associated with a plurality of input terminals of said first multiple switch means and adapted for connection to said amplifier input terminals, said second fixed contacts being slidably engagable with a said pad on the other side of said plates, and means for rotating said plates relative to said first and second fixed contacts.

5,182,466

CONNECTION POLARITY SWITCHING APPARATUS

Yasuo Ohkubo, Miyoshi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 14, 1991, Ser. No. 715,657
Claims priority, application Japan, Jun. 14, 1990, 2-155728
Int. Cl.[5] H02B *1/24*
U.S. Cl. 307—127 **2 Claims**



1. A connection polarity switching apparatus inserted in a single transmission path between a network communications cable having at least two lines and a sending and receiving circuit which performs signal send and receive with respect to said communications cable, comprising:

(a) an idle status detection means for detecting that a status of said network is an idle status, including:

(1) a first comparison means, connected to said at least two lines and outputting a comparison signal,

(2) a differentiating circuit, responsive to said comparison signal, for differentiating said comparison signal and providing an output, and

(3) a count means, having a count time set shorter than a rated idle time, which starts a count operation in response to the output of said differentiating circuit and which outputs and idle status signal;

(b) a judgment means for judging a polarity of said communications cable in response to said idle status signal on the basis of a signal level of said communications cable and outputting polarity judgment signals corresponding to said communication cable polarity; and

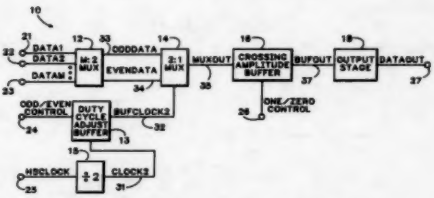
(c) a polarity switching means for switching the polarity of said signal send and receive in accordance with a polarity indicated by said polarity judgment signals output from said judgment means.

5,182,467

HIGH PERFORMANCE MULTIPLEXER FOR IMPROVING BIT ERROR RATE

Stewart S. Taylor, Beaverton; Gary D. McCormack, Aloha; William H. Davenport, Hillsboro, and Patrick J. Hamilton, Aloha, all of Oreg., assignors to TriQuint Semiconductor, Inc., Beaverton, Oreg.

Filed Aug. 22, 1991, Ser. No. 748,461
Int. Cl.[5] H03K *17/56, 17/00*
U.S. Cl. 307—243 **23 Claims**



1. A multiplexer system comprising:

means for generating a variable duty cycle clock signal; a two-to-one multiplexer having first and second data inputs for respectively receiving first and second input signals, a clock input for receiving the variable duty cycle clock signal, and an output for providing a multiplexed output signal;

means coupled to the output of the multiplexer for adjusting the amplitude of crossing points of the multiplexed signal to form an offset multiplexed output signal; and

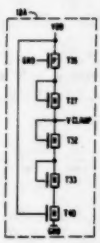
an output stage having an input for receiving the offset multiplexed output signal and an output for providing an error-corrected multiplexed output signal.

5,182,468

CURRENT LIMITING CLAMP CIRCUIT

Charles K. Erdelyi; Mark G. Marshall, both of Essex Junction; John W. Mathews, Burlington, and Patrick E. Perry, Colchester, all of Vt., assignors to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 309,530, Feb. 13, 1989. This application May 6, 1991, Ser. No. 696,380
Int. Cl.[5] G05F *3/16, 3/20*
U.S. Cl. 307—296.1 **3 Claims**



1. A current limiting clamp circuit for providing a clamped voltage at a node, the circuit comprising:

first and second P-type MOS transistors; and

a plurality of N-type MOS transistors connected in series between the node and ground;

wherein said first P-type MOS transistor has its source connected to a power supply, its gate connected to ground, and its drain connected to the source of said second P-type MOS transistor, said second P-type MOS transistor has its gate and drain connected to the node.

5,182,469

INTEGRATED CIRCUIT HAVING BIPOLAR TRANSISTORS AND FIELD EFFECT TRANSISTORS RESPECTIVELY USING POTENTIALS OF OPPOSITE POLARITIES RELATIVE TO SUBSTRATE

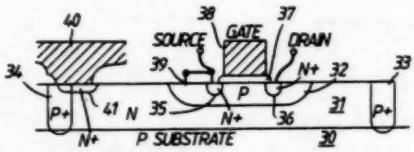
Joseph D. Farley, Villeneuve Loubet, France, and Frank Fattori, Bedford, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 251,926, Sep. 28, 1988, abandoned, which is a continuation of Ser. No. 849,100, Apr. 7, 1986, abandoned. This application Jan. 4, 1990, Ser. No. 460,688

Claims priority, application United Kingdom, May 15, 1985, 8511256

Int. Cl.[5] H01L *27/04*

U.S. Cl. 307—296.2 **12 Claims**



1. An integrated circuit comprising:

a semiconductor substrate;

a plurality of semiconductor circuit components on said semiconductor substrate;

said plurality of semiconductor circuit components including respective first and second groups of semiconductor circuit components interconnected in a single circuit;

said first group of semiconductor circuit components including at least one transistor having a plurality of electrodes and at all of whose electrodes appear potentials which are positive with respect to said substrate;

said second group of semiconductor circuit components including at least one transistor having a plurality of electrodes and at all of whose electrodes appear potentials which are negative with respect to said substrate; and

means providing reverse-biased PN junctions electrically isolating at least some of said plurality of semiconductor circuit components included in said first and second groups of semiconductor circuit components from each other.

5,182,470

NEGATIVE OVERVOLTAGE PROTECTION CIRCUIT, IN PARTICULAR FOR OUTPUT STAGES

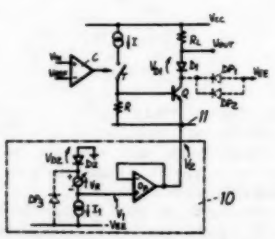
Roberto Gariboldi, Lacchiarella, and Alberto Gola, Broni, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Oct. 5, 1990, Ser. No. 593,430

Claims priority, application Italy, Oct. 9, 1989, 21966 A/89

Int. Cl.[5] H03K *3/01*

U.S. Cl. 307—296.4 **11 Claims**



1. An output stage with a protection circuit against negative overvoltage at its output terminal, comprising:

a negative overvoltage protection circuit having a first terminal connected to said output terminal of said stage and a second terminal;

an output transister having a collector connected to said second terminal of said negative overvoltage protection circuit, a base and an emitter;

control means connected to said base to actuate said output transistor between a substantially conducting state and a substantially nonconducting state;

means interposed between a positive supply voltage line and said output terminal to bias said negative overvoltage protection circuit and said output transistor; and

a voltage generating circuit, connected between said emitter and a ground reference line, comprising voltage source means, for generating a reference voltage the value whereof can be preset with respect to said ground reference line to substantially compensate for a voltage drop across said negative overvoltage protection circuit.

5,182,471

HYSTERESIS COMPARATOR

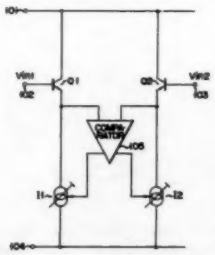
Yoshihiro Yoshida, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 19, 1991, Ser. No. 687,740

Claims priority, application Japan, Apr. 21, 1990, 2-105910

Int. Cl.[5] H03K *5/22*

U.S. Cl. 307—355 **21 Claims**



1. A hysteresis comparator, comprising:

first and second input terminals for receiving first and second input signals;

at least one output terminal;

first and second power supply terminals;

a first transistor having a collector coupled to said first power supply terminal, a base coupled to said first input terminal, and an emitter;

a second transistor having a collector coupled to said first power supply terminal, a base coupled to said second input terminal, and an emitter;

a first current source coupled between the emitter of said first transistor and said second power supply terminal;

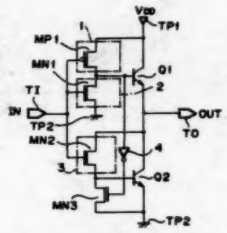
a second current source coupled between the emitter of said second transistor and said second power supply terminal; and

sensing and control circuitry for sensing a difference between emitter voltages of said first and second transistors and controlling, by supplying the sensed difference to said first and second current sources, a current of at least one of said first and second current sources in accordance with the sensed difference to produce an offset voltage between said first and second input terminals.

5,182,472
LOGIC CIRCUIT WITH BIPOLAR CMOS CONFIGURATION

Koichi Ando, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 7, 1991, Ser. No. 651,802
Claims priority, application Japan, Feb. 8, 1990, 2-30136; Feb. 28, 1990, 2-50014
Int. Cl.[5] H03K *17/16*
U.S. Cl. 307—446 **5 Claims**



1. A logic circuit comprising:

a logic circuit portion connected to an input terminal and including a first MOS transistor circuit of one conductivity type, a second MOS transistor circuit of an opposite conductivity type and a third MOS transistor circuit of said opposite conductivity type, said logic circuit portion conducting a predetermined logical operation;

an outputting circuit portion connected to said logic circuit portion and including a first bipolar transistor having a collector connected to a first power supply terminal and an emitter connected to an output terminal for outputting an output signal based on the logical operation conducted in said logic circuit portion, and a second bipolar transistor having a collector connected to said output terminal and an emitter connected to a second power supply terminal;

a discharging MOS transistor of said opposite conductivity type having a drain connected to a base of said second bipolar transistor, said discharging MOS transistor discharging the charge in the base of said second bipolar transistor; and

an inverter circuit having an output connected to a gate of said discharging MOS transistor, said inverter circuit applying a signal whose level is opposite to said output signal, wherein

said inverter circuit has an input connected to a base of said first bipolar transistor.

5,182,473
EMITTER EMITTER LOGIC (EEL) AND EMITTER COLLECTOR DOTTED LOGIC (ECDL) FAMILIES

Jan A. Wikstrom; Mark S. Birrittella; David Kiefer, all of Chippewa Falls; Stephen B. Smetana, Eau Claire, and Vernon W. Swanson, Chippewa Falls, all of Wis., assignors to Cray Research, Inc., Chippewa Falls, Wis.

Continuation-in-part of Ser. No. 560,134, Jul. 31, 1990, abandoned. This application Jan. 22, 1992, Ser. No. 826,214
Int. Cl.[5] H03K *19/08*
U.S. Cl. 307—454 **36 Claims**

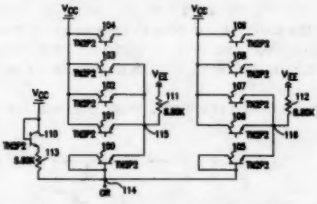
1. A logic circuit, comprising:

(a) a plurality of logic gates, each of said plurality of logic gates comprising:

(i) a plurality of first transistors, each of said plurality of first transistors having a collector directly coupled to a first voltage terminal, an emitter coupled to a node, and a base coupled to one each of a plurality of first input terminals;

(ii) a diode having a cathode coupled to said node and an anode coupled to a first output terminal; and

(iii) means, coupled between said node and a second voltage terminal, for sinking current; and

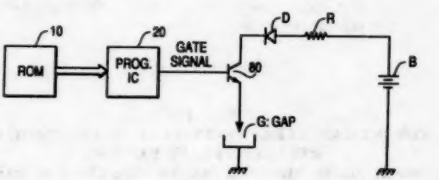


(b) a driver, coupled to said first output terminal, comprising means for amplifying a voltage and restoring logic levels at said first output terminal.

5,182,474
PULSE CONTROL CIRCUIT FOR ELECTRIC DISCHARGE MACHINE USING PROGRAMMABLE LOGIC

Yuji Kaneko, Kanagawa, Japan, assignor to Sodick Co., Ltd., Kanagawa, Japan

Filed Mar. 26, 1991, Ser. No. 675,168
Int. Cl.[5] B23H *7/04*; H03K *19/20*
U.S. Cl. 307—465 **5 Claims**



1. In an electric discharge machine, a pulse control apparatus comprising:

means for specifying circuit function definition data from a set of circuit function definition data for defining a desired circuit configuration;

storage means for storing said set of circuit function definition data;

programmable circuit means operatively connected to receive from said storage means the specified circuit function definition data for structuring logic circuits into said desired circuit configuration specified by said circuit function definition data; and

pulse control means responsive to said desired circuit configuration for providing control pulses to said electric discharge machine.

5,182,475
ECL TO CMOS VOLTAGE TRANSLATOR WITH BIPOLAR TRANSISTOR

Chuen-Der Lien, Mountain View, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

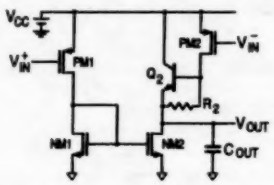
Filed Sep. 20, 1991, Ser. No. 762,960
Int. Cl.[5] H03K *19/0175*
U.S. Cl. 307—475 **14 Claims**

1. A circuit for translating ECL level voltages to CMOS level voltages, comprising:

gain stage circuitry including PMOS transistors having gates which receive ECL level voltage signals, and a bipolar transistor means connected to a first one of the PMOS transistors for increasing the speed at which the gain stage circuitry develops output signals in response to changes in the ECL level voltage signals;

resistive loading stage circuitry including NMOS transistors, each of said NMOS transistors including a gate, a source, and a drain, wherein the gates of the NMOS transistors are connected to a drain of a second one of the PMOS transistors, the drains of the NMOS transistors are connected to the gain stage circuitry for receiving said output signals, and the sources of the NMOS transistors are connected to ground; and

an output terminal at which CMOS level voltage signals are



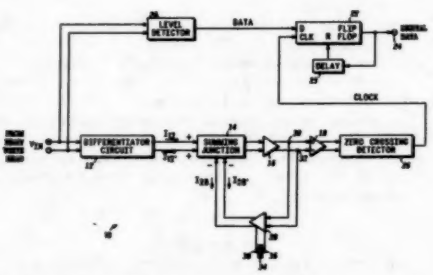
developed in response to the ECL level voltage signals, wherein the output terminal is connected to the drain of a first one of the NMOS transistors and to the gain stage circuitry, wherein the bipolar transistor means includes a first bipolar transistor having a base connected to a non-gate terminal of the first one of the PMOS transistors and an emitter connected to the output terminal, and wherein the bipolar transistor means also includes a first resistor means connected between the base and the emitter of the first bipolar transistor.

5,182,476

OFFSET CANCELLATION CIRCUIT AND METHOD OF REDUCING PULSE PAIRING

John E. Hanna, Mesa, and Behrooz Abdi, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 29, 1991, Ser. No. 737,282
Int. Cl.[5] G06G *7/10*; H03B *1/00*
U.S. Cl. 307—491 **15 Claims**



1. An offset cancellation circuit, comprising:

a differentiator circuit having an input coupled for receiving an input signal with a DC offset and having an output for providing a differentiated signal with a DC offset;

a summing junction having first and second inputs and an output, said first input receiving said differentiated signal with said DC offset, said output providing an offset corrected signal; and

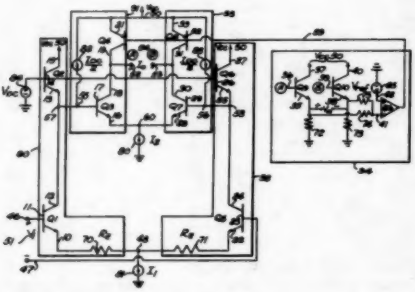
a first amplifier circuit having an input coupled to said output of said summing junction and having an output coupled to said second input of said summing junction for providing an offset correction signal to remove said DC offset from said differentiated signal.

5,182,477

BIPOLAR TUNABLE TRANSCONDUCTANCE ELEMENT

Richard G. Yamasaki, Torrance, and Geert A. De Veirman, Irvine, both of Calif., assignors to Silicon Systems, Inc., Tustin, Calif.

Continuation of Ser. No. 497,863, Mar. 22, 1990. This application Jan. 14, 1992, Ser. No. 823,067
Int. Cl.[5] H03F *3/45*; H03K *5/20*
U.S. Cl. 307—494 **9 Claims**



1. A transconductance circuit comprising:

a Gilbert multiplier core having first and second input stages for receiving a differential input voltage;

first and second gain stages coupled to said first and second input stages, respectively, said first and second gain stages providing an output current;

an input of said first gain stage coupled to a supply voltage through a first current source;

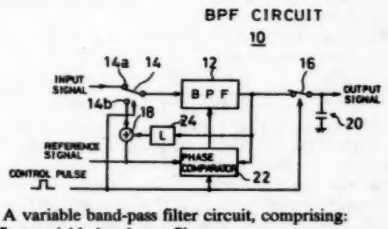
an input of said second gain stage coupled to said supply voltage through a second current source.

5,182,478

VARIABLE BAND-PASS FILTER CIRCUIT

Hiroshi Nomura, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 30, 1991, Ser. No. 767,783
Claims priority, application Japan, Sep. 29, 1990, 2-260778
Int. Cl.[5] H03B *1/00*; H03K *5/00*
U.S. Cl. 307—521 **4 Claims**



1. A variable band-pass filter circuit, comprising:

a first variable band-pass filter;

reference signal applying means for applying a reference signal;

phase-comparing means for phase-comparing an output signal of said first variable band-pass filter with said reference signal to output a control signal for controlling said first variable band-pass filter;

level limiting means for receiving said output signal from said first variable band-pass filter;

adding means for adding an output from said level limiting means and said reference signal to each other so as to apply the same to an input of said first variable band-pass filter; and

a first switch which is controlled by a switching signal in a

first state wherein an input signal to be filtered by said variable band-pass filter circuit is applied to said input of said first variable band-pass filter through said first switch or in a second state wherein an output of said adding means is applied to said input of said first variable band-pass filter through said switch.

5,182,479

GATE CIRCUIT HAVING INCREASED VOLTAGE HANDLING CAPABILITY

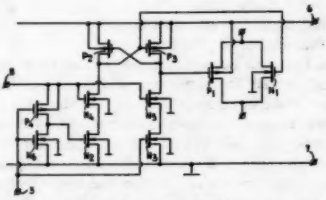
Frank P. Behagel, Eindhoven; Tiemen Poorter, Heerlen, and Petrus A. C. M. Nuijten, Eindhoven, all of Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 319,772, Mar. 7, 1989, abandoned. This application Feb. 7, 1991, Ser. No. 658,792

Claims priority, application Netherlands, Jun. 24, 1988, 8801611

Int. Cl.[5] H03K *17/687, 5/13, 19/094, 3/26*

U.S. Cl. 307—571 **5 Claims**



1. A gate circuit comprising an N-channel and a P-channel insulated-gate field-effect transistor, whose parallel-connected drain-source paths constitute a signal gate, and a control circuit connected to their respective gate electrodes to switch the state of the field-effect transistors, characterized in that means are provided for protecting said N-channel transistor from drain-source voltage overload, said protecting means comprising means for turning on the N-channel field-effect transistor at least a drain-source voltage lower than a selected value, in that said protecting means comprises delay means coupled to the control circuit for turning on the N-channel field-effect transistor with a delay relative to turning on the P-channel field-effect transistor, and in that the control circuit comprises an inverter circuit and a first and a second series arrangements of an N-channel and a P-channel field-effect transistor, which series arrangements are each coupled across a first and a second power-supply terminal, two field-effect transistors of a selected one conductivity type in said series arrangements being cross-coupled to each other to form a bistable trigger circuit, the gate electrode of a field-effect transistor of a selected other conductivity type in the first series arrangement being coupled by said inverter circuit; and the gate electrode of a corresponding field-effect transistor of the second series arrangement being coupled directly to a control input terminal for controlling the N-channel and P-channel field-effect transistors of the signal gate, whose gate electrodes are coupled to the first and the second series arrangements, respectively, and the control circuit further comprising at least one pair of further field-effect transistors which are arranged in cascode with the field-effect transistors of, respectively, the first and the second series arrangement and whose gate electrodes comprise terminals for applying an at least one auxiliary voltage.

5,182,480

PULSE DELAY CIRCUIT HAVING TWO COMPARATORS

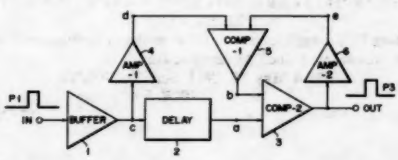
Kuniaki Goto, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 19, 1990, Ser. No. 584,979

Claims priority, application Japan, Sep. 21, 1989, 1-243312

Int. Cl.[5] H03K *5/159*

U.S. Cl. 307—608 **12 Claims**



1. A circuit for receiving and generating pulses, the circuit comprising:

receiving means for receiving a first signal having a first signal pulse;

first generating means, responsive to the first signal pulse, for generating a second signal to indicate a width of the first signal pulse;

second generating means, having an input for receiving a third signal having a third signal pulse, for generating a fourth signal to indicate a width of the third signal pulse;

delaying means for delaying the first signal to generate a fifth signal;

comparing means for comparing the second signal to the fourth signal to generate a sixth signal; and

third generating means, responsive to the fifth and sixth signals, for generating the third signal having the third signal pulse, the third signal pulse having a rising edge and a falling edge occurring in accordance with relative voltages of the fifth and sixth signals.

5,182,481

VOICE COIL TYPE ACTUATOR

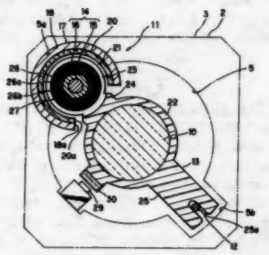
Satoshi Sakamoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 701, 811, May 17, 1991, abandoned. This application May 1, 1992, Ser. No. 879,168

Claims priority, application Japan, May 28, 1990, 2-137614

Int. Cl.[5] H02K *41/00;* **G02B** *7/02*

U.S. Cl. 310—13 **19 Claims**



1. A voice coil type actuator for linearly displacing a movable lens in a lens system of a camera, comprising:

a guide shaft formed of a material, at least a portion in a radial direction in a cross-section of which is permeable;

a movable member supporting said movable lens and slidably supported on the guide shaft;

a movable coil supported coaxially with the guide shaft on the movable member;

a generally tubular yoke surrounding the movable coil and covering a range of a movement of the movable coil;

a magnetic field generating magnet being contacted with the yoke and having a cutout corresponding to an axially extending cutout formed in the yoke; and

a portion of the movable member projecting through the cutouts of the magnetic field generating magnet and the yoke for supporting said movable lens for linear movement with said movable member in said camera.

5,182,482

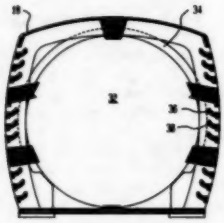
DYNAMOELECTRIC MACHINE HAVING IMPROVED VENTILATION

Robert R. Burke, Cincinnati, Ohio, assignor to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed May 15, 1991, Ser. No. 700,786

Int. Cl.[5] H02K *5/00*

U.S. Cl. 310—89 **17 Claims**



4. A dynamoelectric machine comprising:

a cylindrical rotor mounted on an elongated rotatable shaft;

a stator surrounding the rotor, formed of a plurality of laminations;

a cast yoke having fist and second sides and defining a substantially cylindrical chamber for surrounding the stator, the rotor and the rotatable shaft;

first and second cast bearing brackets mounted on first and second ends of the yoke for relatively capturing the elongated bearing shaft;

each of the first and second sides having rows of exhaust ventilation openings integrally formed therein permitting exit of coolant from the chamber each of the exhaust ventilation openings extending from an exterior surface of the housing into the chamber in a direction generally normal to an outer surface of one of the first and second sides that is proximal the openings, the integrally formed opening thereafter sweeping generally tangentially distal the surface in a generally upwardly direction relative to the respective housing surface to permit exit of coolant from the chamber, while substantially avoiding entry of precipitation and foreign objects into the chamber.

5,182,483

SQUIRREL-CAGE ROTOR WITH SHAPED-CONDUCTOR HARMONIC REDUCTION

Sadayoshi Hibino, Suzuka; Tadayuki Sato, Mie, and Motoyasu Mochizuki, Aichi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Dec. 27, 1990, Ser. No. 634,574

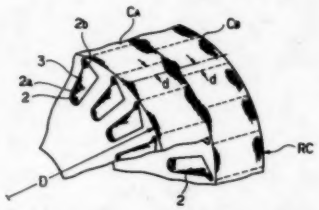
Claims priority, application Japan, Dec. 28, 1989, 1-344377; Mar. 30, 1990, 2-85725; Mar. 30, 1990, 2-85726; Oct. 26, 1990, 2-290499

Int. Cl.[5] H02K *17/16*

U.S. Cl. 310—211 **10 Claims**

1. A squirrel-cage rotor for use in a motor of the slotted stator core type comprising:

a) a rotor core comprising one or a plurality of first units of steel sheets and one or a plurality of second units of steel sheets, each unit being composed of a plurality of steel sheets each having a number of slot-forming punched portions for forming slots, the number of which differs from the number of slots of a stator core, each punched portion including a main portion and an additional portion extended from the main portion toward the outer circumference of the rotor and inclined in the direction of either one of two sides along the circumference of the rotor relative to the position of the main portion such that each



punched portion has any unsymmetrical configuration, each main portion having the center deviated from a distal end of each additional portion by a distance d satisfying the following expression (A) circumferentially of the rotor:

$$\frac{\pi D}{4(z+p)} \leq d \leq \frac{\pi D}{4(z-p)} \qquad \text{(A)}$$

where

D=rotor diameter

z=the number of stator slots

p=the number of pole pairs

each first unit being composed of the steel sheets laminated so that the respective additional portions are inclined in the direction of the one side along the circumference of the rotor relative to the positions of the respective main portions and so that the main portions are piled on upon another, each second unit being composed of the steel sheets laminated so that the respective additional portions are inclined in the direction of the other side along the circumference of the rotor relative to the positions of the respective main portions and so that the main portions are piled one upon another;

b) rotor bars embedded in slots of the rotor core formed by the punched portions of the steel sheets laminated, respectively; and

c) end rings provided for short-circuiting the rotor bars at both ends of the rotor core, respectively.

5,182,484

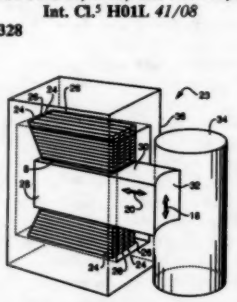
RELEASING LINEAR ACTUATOR

Gordon W. Culp, Van Nuys, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Jun. 10, 1991, Ser. No. 712,821

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—328 **25 Claims**



1. A releasing actuator comprising,

a bolt for engaging and moving an object, the bolt having an end and a side,

a pair of actuators on one side of the bolt and a pair of actuators on the opposing side of the bolt, the actuators in each pair being adjacent, for engaging and moving said bolt,

a housing adjacent to said object, said actuators attached to said housing,

said actuators having a lifter portion and a tangenter portion wherein, said lifter portion and said tangenter portion combine to produce a first function and a second function for moving the bolt,

said first function having a means for controlling the tangenters and lifters to move the bolt perpendicularly with respect to the object for engaging the object,

said second function having a means for controlling the tangenters and lifters to move the bolt tangentially with respect to the object for moving the object,

a means for controlling the lifters to release the bolt, whereby the object is released by the bolt.

5,182,485

ULTRASONIC TRANSDUCER COMPRISING AT LEAST ONE ROW OF ULTRASONIC ELEMENTS

Marcel R. de la Fonteijne, Delft, Netherlands, assignor to B.V. Optische Industrie "De Oude Delft", Delft, Netherlands

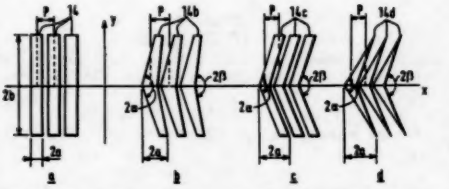
PCT No. PCT/EP89/00739, § 371 Date Nov. 19, 1990, § 102(e) Date Nov. 19, 1990, PCT Pub. No. WO90/00792, PCT Pub. Date Jan. 25, 1990

PCT Filed Jun. 28, 1989, Ser. No. 623,393

Claims priority, application Netherlands, Jul. 13, 1988, 8801776

Int. Cl.[5] H01L *41/08*

U.S. Cl. 310—334 **4 Claims**



1. An ultrasonic transducer which comprises at least one row of ultrasonic elements having transverse side edges of consecutive elements extending obliquely with respect to a center axis (x) of said row of ultrasonic elements, each of said ultrasonic elements of a width in a lateral direction greater than a distance between central points of consecutive ultrasonic elements on said center axis of said row of ultrasonic elements.

5,182,486

CERAMIC ELECTRIC-DISCHARGE LAMP INCORPORATING ARC TUBE HAVING AT LEAST TWO CURVED REGIONS

Akira Itoh; Kazuyoshi Okamura, both of Yokohama, and Kazuiki Uchida, Fujisawa, all of Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan

Filed Aug. 30, 1990, Ser. No. 574,775

Claims priority, application Japan, Aug. 31, 1989, 1-223303; Sep. 12, 1989, 1-234654

Int. Cl.[5] H01J *61/33, 61/34*

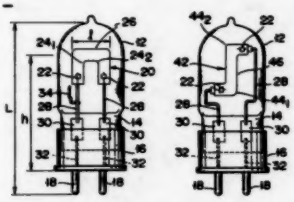
U.S. Cl. 313—25 **8 Claims**

1. A ceramic electric-discharge lamp comprising:

an arc tube which is composed of a translucent ceramic envelope internally sealing a luminous metal, a buffer metal, and an actuating rare gas, said arc tube further sealing a pair of electrodes, one each near an end of said envelope thereof;

a base member connected to said pair of electrodes sealed inside said arc tube via wiring means, said base member being adapted for connection to an external power source;

wherein said arc tube has at least two linear portions and curved portions, where a radius of curvature of said



curved portions varies against said linear portions, wherein any two adjacent ones of said at least two curved portions define a substantial illuminant therebetween, wherein each of said linear portions comprises a linear wall and each of said curved portions comprises an inner wall and an outer wall and wherein the inner walls are formed to be thicker than the outer walls.

5,182,487

DEFLECTION YOKE DEVICE

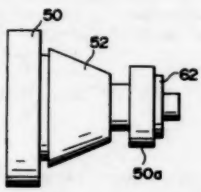
Shinji Ohtsu, Tokyo, Japan, assignor to Murata Mfg. Co., Ltd., Kyoto, Japan

Filed Sep. 4, 1990, Ser. No. 577,126

Claims priority, application Japan, Sep. 19, 1989, 1-109528[U]

Int. Cl.[5] H01J *29/70*

U.S. Cl. 313—440 **20 Claims**



1. A deflection yoke device having two horizontal deflection coils that are respectively wound into a saddle-type configuration at mutually opposing positions on an outer side of a tapered side wall of a CRT and are adapted to supply a horizontally deflecting magnetic field to the interior of said CRT upon receipt of a horizontally deflecting current so as to horizontally deflect an electron beam traveling in said CRT, said deflection yoke device comprising:

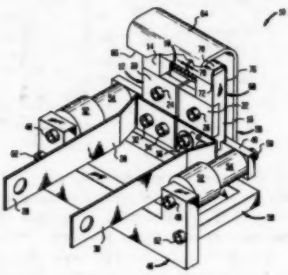
at least one correction coil connected and proximal to said horizontal deflection coils and disposed on a neck side of said CRT, as viewed from said horizontal deflection coils, said at least one correction coil producing a barrel magnetic field synchronized with and for correcting the horizontally deflecting magnetic field while improving the electron beam focus.

5,182,488

ELECTRON BEAM GUN FOR USE IN AN ELECTRON BEAM EVAPORATION SOURCE

Russell J. Hill, El Cerrito, and P. A. Joel Smith, San Pablo, both of Calif., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Aug. 27, 1991, Ser. No. 750,363
Int. Cl.[5] H01J *29/46*; B23K *15/00*
U.S. Cl. 313—446 **3 Claims**



1. In an electron beam gun for use in an electron beam evaporation source including: a split cathode block having two electrically conductive sides; a filament located between the two sides of the cathode block and connected to the two sides of the cathode block so that an electric current applied to the sides of the cathode block causes the filament to emit electrons; an anode having a top section of inverted U shaped cross-section passing over the filament and terminating in a front edge located in front of the filament; and a beam former having a top section of inverted U shaped cross-section, located between the anode and the filament and configured so that the filament is shielded from the anode and the electrons are constrained to pass beneath the top section of the beam former and toward the front edge of the top section of the anode in a ribbon shaped electron beam, the improvement comprising:

the beam former having two sections with a vertical gap between the sections;

the two sections separately connected to the two sides of the cathode block so that the two sections of the beam former are in good thermal contact with the two sides of the cathode block and the two sides of the cathode block act as heat sinks for the two sections of the beam former to prevent a non-uniform thermal gradient from being produced within the beam former and consequent thermal warpage and movement of the beam former; and

the gap between the two sections of the beam former sized such that electrons cannot pass through the gap to the anode.

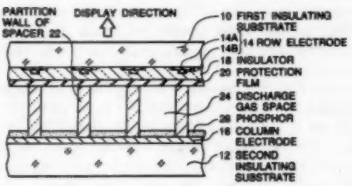
5,182,489

PLASMA DISPLAY HAVING INCREASED BRIGHTNESS

Yoshio Sano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 629,420
Claims priority, application Japan, Dec. 18, 1989, 1-328827
Int. Cl.[5] H01J *61/067, 61/42*
U.S. Cl. 313—485 **12 Claims**

1. In a plasma display panel of the surface discharge type in which a maintaining discharge is generated between electrodes formed on the same substrate, said display panel including first and second insulating substrates separated from each other to form a discharge space therebetween, a spacer having a partition wall in the form of a grid located between said first and second insulating substrates so as to partition said discharge space into a number of pixels, each of of said pixels being defined by said first and second insulating substrates and said partition wall of said spacer, said pixels being separated from one another by said partition wall of said spacer; the improvement comprising: a discharge gas filling said discharge space, electrodes on said second insulating substrate for initiating a discharge of said discharge gas in said discharge space and extending in a first direction, electrodes on said first insulating substrate for maintaining said discharge and extending substantially along said partition wall in a second direction intersecting said first direction, each of said electrodes for maintaining said discharge including a combination of a transparent electrode and a metal electrode, and phosphor located on said second insulating substrate and on said discharge initiating electrodes, said first insulating substrate being located at a display side of said panel.

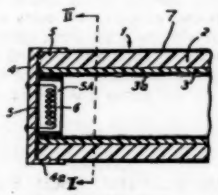


5,182,490

LIGHT SOURCES

John G. Holden, Hemel Hempstead, and Ian A. Shanks, Penn, both of Great Britain, assignors to Thorn EMI plc, London, England

Filed Aug. 7, 1990, Ser. No. 563,755
Claims priority, application United Kingdom, Aug. 8, 1989, 8918114
Int. Cl.[5] H01J *1/70, 5/04*
U.S. Cl. 313—485 **11 Claims**



1. A light source comprising

a) a hollow support body made of a first main layer of plastics material containing at least one organic fluorescent dye, a second layer of inorganic material deposited on the inner surface of said first layer, and a third layer of a phosphor material attached to the inner surface of the second layer;

b) thermionic electron source excitation means;

c) fixing means for fixing said thermionic electron source excitation means to said support body;

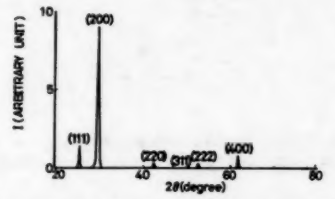
said second layer of inorganic material serving as a barrier layer for absorbing ultraviolet radiation generated by said excitation means.

5,182,491

THIN FILM ELECTROLUMINESCENT DEVICE

Kazuo Taguchi, Tokyo; Kenichi Onisawa, Ibaraki; Moriaki Fuyama, Ibaraki; Katsumi Tamura, Ibaraki; Yoshio Abe, Ibaraki; Takahiro Nakayama, Ibaraki; Kenichi Hashimoto, Ibaraki, and Akira Sato, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 268,727, Nov. 7, 1988, Pat. No. 5,099,172. This application Mar. 17, 1992, Ser. No. 852,942
Claims priority, application Japan, Nov. 9, 1987, 62-282843
The portion of the term of this patent subsequent to Mar. 24, 2009, has been disclaimed.
Int. Cl.[5] H05B *33/14*
U.S. Cl. 313—503 11 Claims



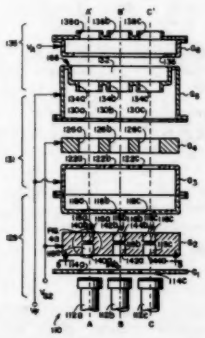
1. A thin film EL device comprising a substrate of a transparent electrical insulator, a first electrode formed on said substrate, an EL layer formed on said first electrode through a transparent first insulating layer interposed therebetween, a transparent second insulating layer enclosing the exposed part of said EL layer, and a second electrode formed on said second insulating layer, wherein at least one of said first and second electrodes is transparent, said EL layer contains, as its host material, strontium sulfide whose crystals strongly tend to have a (200) orientation, and the ratio of the X-ray diffraction intensity I(200)/I(111) is more than three.

5,182,492

ELECTRON BEAM SHAPING APERTURE IN LOW VOLTAGE, FIELD-FREE REGION OF ELECTRON GUN

Hsing-Yao Chen, Barrington, Ill., assignor to Chunghwa Picture Tubes, Ltd., Taoyuan, Taiwan

Filed May 20, 1992, Ser. No. 885,880
Int. Cl.[5] H01J *29/46, 29/56*
U.S. Cl. 315—14 28 Claims



1. A lens for focusing a center electron beam and two outer electron beams to respective spots on a display screen, wherein each of said electron beams is comprised of energetic electrons emitted by a source along a respective axis and wherein said electron beams are focused by a main lens and accelerated by an anode voltage V_A toward said display screen, said lens comprising:

low voltage beam forming means proximally disposed relative to the source of electrons for forming the energetic electrons into said center and two outer electron beams, said beam forming means including a charged electrode having a thickness to along used axes for providing a relatively electrostatic field-free region on the respective axes of each of said electron beams;

high voltage asymmetric focusing means disposed intermediate said beam forming means and the display screen for focusing each of said electron beams to a respective spot on the display screen, wherein said asymmetric focusing means imposes an asymmetric electrostatic field on said electron beams giving rise to electron beam spot distortion on the display screen; and

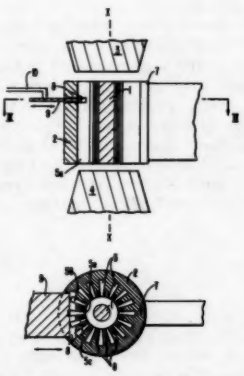
means for defining two outer beam shaping apertures in said charged electrode, wherein each beam shaping aperture is disposed on a respective axis of an outer electron beam in said relatively electrostatic field-free region for intercepting a peripheral lateral portion of an associated outer electron beam and removing electrons form an outer portion of said beam in compensating for said asymmetric electrostatic field and reducing electron beam spot distortion on the display screen, wherein said beam shaping aperture has a curvilinear, non-circular shape and a horizontal width d, where t>d.

5,182,493

RISING SUN MAGNETRON WITH PLANAR TUNING MEMBER PROTRUDING INTO ONLY ONE SET OF CAVITIES

Mark A. Robertson, Essex, England, assignor to EEV Limited, Chelmsford, United Kingdom

Filed Feb. 5, 1991, Ser. No. 650,618
Claims priority, application United Kingdom, Feb. 6, 1990, 90025931
Int. Cl.[5] H01J *25/593*
U.S. Cl. 315—39.610 15 Claims



1. A magnetron for generating radiation at a predetermined frequency comprising:

a cathode having a longitudinal axis;

a cylindrical anode coaxially surrounding said cathode, said anode having

first and second ends disposed along said longitudinal axis;

first and second sets of anode cavities disposed radially within said cylindrical anode and distributed circumferentially about said longitudinal axis between the first and second ends of said anode, each cavity of said second set of anode cavities being interposed between adjacent cavities of said first set and having a length in the radial direction which is shorter than respective lengths associated with the adjacent cavities of said first set; and

a tuning slot disposed in the anode, said tuning slot extending in a plane substantially orthogonal to said longitudinal axis; and

a tuning member comprised of a dielectric material movable within said tuning slot so as to protrude into at least two cavities of said first set of cavities and which does not protrude into any cavity of said second set of cavities, said tuning member protruding into said tuning slot by an amount which results in radiation being generated by said magnetron at said predetermined frequency.

5,182,494

MULTIPLEXED CONTROL DEVICES FOR A SET OF ELECTRICAL DEVICES, E.G. IN A MOTOR VEHICLE

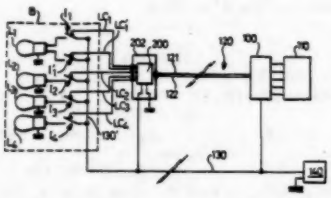
Daniel Segaud, Paris, France, assignor to Valeo Vision, France

Filed Nov. 26, 1990, Ser. No. 617,700

Claims priority, application France, Nov. 27, 1989, 89 15553

Int. Cl.[5] B60Q *1/02*

U.S. Cl. 315—80 **12 Claims**



1. A system for controlling a set of electrical devices in a motor vehicle, the system being of the type comprising a decoding module for a group of such devices, the decoding module receiving an electrical signal containing instructions of a non-preselected sequence to switch on and switch off the electrical devices in the group and delivering control signals on the basis of said instructions, and a set of switches controlled by said control signals and each connected between a common electrical power line and a respective electrical device in the group, wherein the controlled switches are mounted in the immediate vicinity of the respective electrical devices of the group, wherein the decoding module is housed in a housing which is separate from the controlled switches, and wherein individual electrical control lines connect said decoding module to each of said controlled switches.

5,182,495

PLASMA PROCESSING METHOD AND APPARATUS USING ELECTRON CYCLOTRON RESONANCE

Takuya Fukuda; Michio Ohue, both of Hitachi, and Tadasi Sonobe, Iwaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 29, 1990, Ser. No. 619,338

Claims priority, application Japan, Nov. 29, 1989, 1-307718

Int. Cl.[5] H05H *1/18*

U.S. Cl. 315—111.41 **24 Claims**

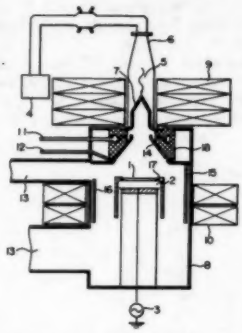
1. A plasma processing apparatus comprising:

a container made at least in part of a conductive material for housing a substance to be processed;

means for generating plasma of a selected component by electron cyclotron resonance in said container;

means for applying a first alternating current electric field to at least a part of a region of said plasma contained in said container; and

means for covering substantially all of the inner surface areas of said container exposed to said plasma, except for a portion thereof on which the substrate to be processed is



located, by a material exhibiting an insulating property at least against said first alternating current electric field.

5,182,496

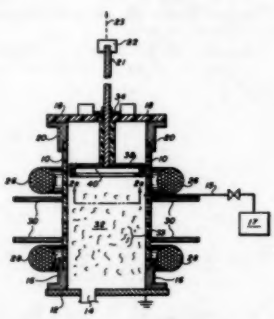
METHOD AND APPARATUS FOR FORMING AN AGILE PLASMA MIRROR EFFECTIVE AS A MICROWAVE REFLECTOR

Wallace M. Manheimer, Silver Spring, Md.; Anthony E. Robson, Alexandria, Va., and Robert A. Meger, Crofton, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 7, 1992, Ser. No. 867,862

Int. Cl.[5] H05H *1/10*

U.S. Cl. 315—111.41 **9 Claims**



1. An apparatus for forming a planar sheet of plasma, said sheet being effective to reflect electromagnetic radiation, said apparatus comprising:

a gas; and

a cathode exposed to said gas;

means for applying a magnetic confinement field to said gas;

wherein said cathode extends along an elongate distance having a preselected curvature transverse to said field;

said apparatus further comprising:

means for triggering formation of a plasma in said gas;

wherein said means for triggering, said cathode, and said means for applying are effective to produce said sheet of plasma with a cross-section having a curvature, in a plane transverse to said field, of substantially the same curvature as said preselected curvature.

5,182,497

CATHODE CLAMPING CIRCUIT APPARATUS WITH DIGITAL CONTROL

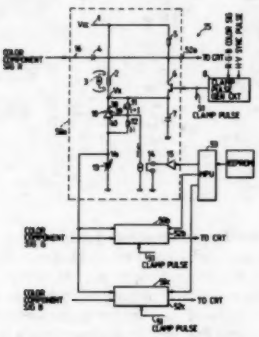
Kazunori Yamate; Hideo Kinoshita, both of Osaka; Chikara Uenishi, Chigasaki; Masafumi Ugajin; Shinichi Kidokoro, both of Fujisawa, and Hiroshi Yamagiwa, Kamakura, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 25, 1992, Ser. No. 841,090

Claims priority, application Japan, Feb. 27, 1991, 3-32796

Int. Cl.[5] H01J *29/52*

U.S. Cl. 315—383 **5 Claims**



1. A cathode clamping circuit apparatus with digital control comprising:

(a) first variable voltage generation means for generating a first dc voltage in accordance with manual operation; and

(b) a plurality of cathode clamping circuits for clamping color component signal with dc component voltages respectively, each of said cathode clamping circuits having:

a coupling capacitor for coupling one of said color component signals to an output terminal;

second variable voltage generation means, connected to the first variable voltage generation means, for generating a second dc voltage in accordance with a current signal;

summing means for summing said first and second dc voltages to produce one of said dc component voltages;

d/a converting means responsive to a control signal for producing a voltage signal;

current signal generation means connected to the output of the d/a converter for producing said current signal in accordance with the voltage signal;

clamping means for clamping said one of said color component signals with one of said dc component voltages in response to a clamp pulse signal produced from said color component signals and synchronizing signals accompanied with said color component signals.

5,182,498

SPRING RETURN ROTARY ACTUATOR

Leslie P. Stuhr, Corcoran, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 27, 1991, Ser. No. 800,171

Int. Cl.[5] F16K *31/04*

U.S. Cl. 318—15 **11 Claims**

1. An electrically powered spring return rotary actuator, comprising:

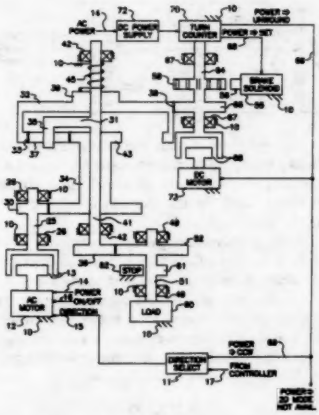
a) a frame;

b) a gear train comprising at least first, second, and third mutually coupled gears mounted for rotation within the frame and further including a drive element, a spring element, and an output element, each element mounted for rotation about an axis and to transfer torque to and from one of the first, second, and third gears;

c) a torsion spring coupled at a first end to the spring element and at a second end to the frame, the torsion spring of the type to be wound up by rotation of the spring element in a first direction, and when wound, applying torque to the spring element in a second direction;

d) a spring element lock which is mounted on the frame and connected to the spring element, and having a first state locking the spring element against rotation, and a second state allowing rotation of the spring element;

e) a drive motor mounted on the frame and having a shaft connected to apply torque to the drive element responsive to application of power and locking the drive element responsive to absence of power; and



f) an output element lock having a stop element mounted on the frame and a cog element connected to the output element, and having a first state wherein the cog and stop elements cooperate to lock the output element against rotation in at least a first direction, and a second state allowing rotation of the output element; wherein,

when the spring element lock is in its second state and the output element lock is in its first state, motor torque is applied through the motor shaft, the drive element, and the gear train to the spring element to wind the torsion spring; torque applied by the motor to the drive element when the spring element lock is in its first state applies torque through the gears to the output element; and when the output element lock is in its second state, power is absent, and the torsion spring is wound, the torsion spring applies torque to the output element through the spring element and the gears.

5,182,499

SENSORLESS BRUSHLESS MOTOR

Toshio Inaji, Minoo, and Makoto Gotou, Nishinomiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 22, 1991, Ser. No. 780,302

Claims priority, application Japan, Oct. 25, 1990, 2-289129; Oct. 29, 1990, 2-292260

Int. Cl.[5] H02P *6/02*

U.S. Cl. 318—254 **18 Claims**

1. A sensorless brushless motor comprising:

three-phase stator windings;

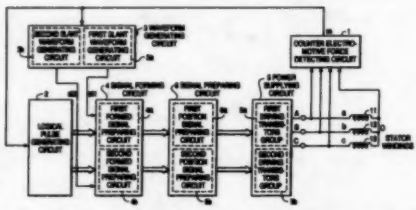
a counter electromotive force detecting means for generating a shaping signal in response to counter electromotive forces respectively induced in said three-phase stator windings;

a logical pulse generating means for generating a plurality of pulse signals in response to said shaping signal;

a waveform generating means for generating slant waveform signals whose slants are started from or substantially from the edge points of said shaping signal;

a signal forming means for forming six-phase position signals from the pulse signals of said logical pulse generating means and the slant waveform signals of said waveform generating means;

a first driving transistors group comprising three transistors, which is controllably caused to conduct in response to



three-phase position signals out of the six-phase position signals of said signal forming means and forms an electric current loop between on terminal of a direct-current power source and electric current receiving terminals of said stator windings; and

a second driving transistors group comprising three transistors, which is controllably caused to conduct in response to the other three-phase position signals out of the six-phase position signals of said signal forming means and forms an electrical current loop between another terminal of said direct-current power source and said electric current receiving terminals of said stator windings.

5,182,500

BRUSHLESS MOTOR CONTROL CIRCUIT

Toshiro Shimada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

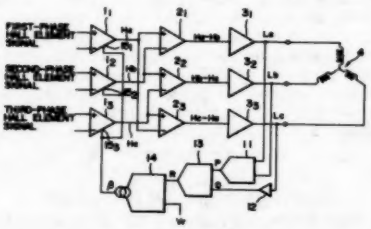
PCT No. PCT/JP90/01172, § 371 Date Apr. 26, 1991, § 102(e) Date Apr. 26, 1991

PCT Filed Sep. 13, 1990 Ser. No. 684,934

Claims priority, application Japan, Sep. 16, 1989, 1-240466

Int. Cl.[5] H02P *6/02*

U.S. Cl. 318—254 **7 Claims**



1. A brushless motor system comprising:

a three-phase motor;

plural stages of amplifiers provided at each of three-phase input lines of said motor for receiving rotor position detection signals of said motor; and

a control circuit for comparing, with a constant value, one of a difference an da sum of a product of two phase signals, among three phase signals outputted from said amplifiers, and a signal as a square of the remaining phase signal, and for feeding back a comparison result signal to said amplifiers on each line at the same stage of said plural stages of amplifiers, thereby controlling the rotation of said motor.

5,182,501

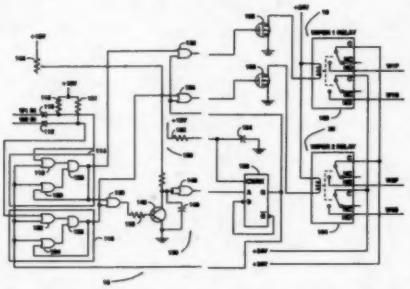
DUAL MOTOR WINDSHIELD WIPER CONTROL SYSTEM

Daniel E. Henderson, Washington, and William E. Allen, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 20, 1991, Ser. No. 763,019

Int. Cl.[5] B60S *1/08*

U.S. Cl. 318—443 **2 Claims**



1. A windshield wiper control system for preventing collisions between first and second wiper elements associated with respective first and second wiper motors, comprising:

first and second synchronizing switches associated with respective ones of said wiper elements and adapted to produce respective synchronizing signals in response to said wiper elements being positioned at corresponding predetermined cycle start locations;

a logic circuit connected to said first and second respective ones of said wiper elements and adapted to produce respective synchronizing signals in response to said wiper elements being positioned at corresponding predetermined cycle start locations;

a logic circuit connected to said first and second synchronizing switches and adapted to produce first and second motor control signals in response to receiving both of said first and second synchronizing signals, said logic circuit including first and second latches each having an input terminal connected to a respective one of said synchronizing switches and having an output terminal, an OR gate having first and second input terminals connected to respective ones of said latch output terminals and having an output terminal, a timer having an input terminal connected to said OR gate output terminal and having an output terminal, and first and second drive transistors each having an input terminal connectable to a respective one of said latch output terminals and having an output terminal; and

first and second motor control relays having respective relay driver coils connected to respective ones of said logic circuit transistor output terminals and respective contact sets connected between a motor power source and respective ones of said motors, said relays being adapted to controllably deliver power to said motors in response to the status of said motor control signals.

5,182,502

AUTOMATIC HEADLAMP DIMMER

Kenneth G. Slotkowski, Westland; Paul A. Michaels, Livonia; Harold R. Macks, Detroit, and Henry J. Ewald, Livonia, all of Mich., assignors to Lectron Products, Inc., Rochester Hills and Ford Motor Company, Dearborn, both of, Mich.

Filed May 6, 1991, Ser. No. 696,162

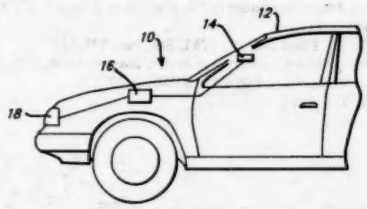
Int. Cl.[5] H05B *41/36*; B60Q *1/14*

U.S. Cl. 315—159 **15 Claims**

1. A system for automatically controlling the energization of the high beam headlamps of a vehicle in accordance with the

presence or absence of light from the headlamps or taillamps of another vehicle, wherein the headlamps of the vehicle comprise conventional unfiltered incandescent lamps that emit light in the visible and infrared regions of the light spectrum, comprising:

sensor means including a light sensor for producing an electrical signal related to the light impinging on said light



sensor, said sensor means being responsive to light in the infrared region of the light spectrum and substantially nonresponsive to light in the visible region of the light spectrum,

control means responsive to said electrical signal from said sensor means for controlling the energization of the high beam headlamps of the vehicle in accordance with a characteristic of said electrical signal.

5,182,503

LOW PRESSURE MERCURY DISCHARGE LAMP CIRCUIT ARRAGEMENT

Jan W. Denneman, Turnhout, Belgium, and Leonardus U. E. Konings, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

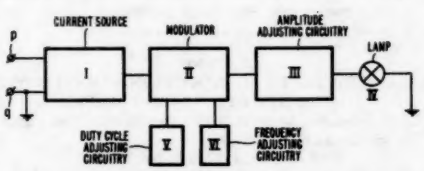
Filed Jan. 9, 1991, Ser. No. 639,501

Claims priority, application Netherlands, Jan. 29, 1990, 9000198

The portion of the term of this patent subsequent to Nov. 17, 2009, has been disclaimed.

Int. Cl.[5] H05B *41/36*

U.S. Cl. 315—224 **6 Claims**



1. A circuit arrangement suitable for operating a low pressure mercury discharge lamp by means of a high-frequency pulsatory current, comprising circuitry for generating the high-frequency pulsatory current from a supply voltage, a modulator for modulating the high-frequency pulsatory current into a substantially square-wave shaped voltage with an amplitude A, a modulation frequency f and a duty cycle DC, said circuit arrangement being provided with circuitry for adjusting the amplitude A of the substantially square-wave shaped voltage, and means for applying an adjusted square-wave shaped voltage to said lamp to obtain a selected color point for said lamp.

5,182,504

RASTER DISTORTION AVOIDANCE ARRANGEMENT

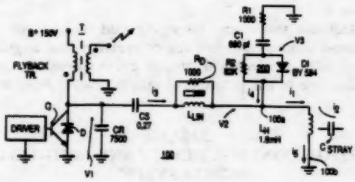
Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Thomson Licensing Corporation, Princeton, N.J.

Filed Feb. 28, 1992, Ser. No. 843,340

Claims priority, application United Kingdom, Jan. 8, 1992, 9200284

Int. Cl.[5] H01J *29/56*

U.S. Cl. 315—370 **15 Claims**



1. A video display deflection apparatus comprising:

a deflection winding;

a retrace capacitance coupled to said deflection winding to form a retrace resonant circuit;

first switching means coupled to said deflection winding for producing a deflection current and a retrace pulse voltage therein;

an inductance coupled in a current path of said deflection current between said deflection winding and said first switching means;

means for generating a pulse of current that is coupled to said inductance and to said deflection winding via a junction terminal, that is in said current path between said inductance and said deflection winding, said pulse of current having both a beginning time and an end time in a vicinity of an instant when said retrace pulse voltage ceases, said pulse of current producing a decrease in a current that flows in said inductance, during a beginning portion of a trace interval.

5,182,505

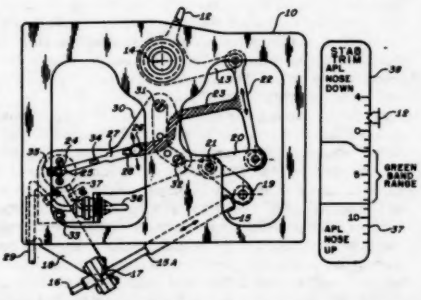
AIRCRAFT CONTROL SURFACE POSITION TRANSDUCER

Harry Miller, Scottsdale, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 19, 1991, Ser. No. 717,759

Int. Cl.[5] B64C *13/30*

U.S. Cl. 318—565 **7 Claims**



1. An apparatus for providing an electrical signal indicative of the position of an aircraft control surface, comprising:

rotary coupling means having an input shaft operatively coupled to said control surface and an output shaft for providing a rotary output representative of a position of said control surface,

extensible coupling means for receiving said output shaft and converting said rotary output into a linear motion proportional in magnitude to said position of said control surface,

quadric chain linkage means coupled to receive said extensible coupling means for converting said linear motion into a substantially translatory displacement of a first linkage member,

further comprising a second linkage member having a first end slideably coupled to said first linkage member and pivotedly adapted at a second end for converting said translatory displacement into a substantially angular motion, and

an electrical transducer engaging said second end of said second linkage member for converting said angular motion into an electrical output proportional thereto and indicative of the position of said aircraft control surface.

5,182,506

POSITION CONTROL DEVICE AND METHOD OF A ROBOT SYSTEM

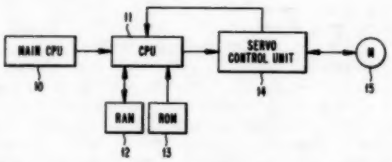
Park Soon-Ho, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyonggi, Rep. of Korea

Filed May 21, 1991, Ser. No. 703,741

Claims priority, application Rep. of Korea, Apr. 15, 1991, 91-6014

Int. Cl.[5] G05B *23/02*

U.S. Cl. 318—568.1 **1 Claim**



1. A position control method of a robot system, comprising the steps of:

receiving moving distance data from a main CPU and computing objective position data corresponding to a position to which an object is to be moved and a first deviation data between the objective position data and actual distance data every sampling time by a central processing unit;

reading-in the actual position data of the motor, computing a second deviation value by subtracting a first motor position data of a previous, first sampling time from the actual position data and a third deviation value by subtracting a second motor position data of a previous, second sampling time from the first motor position data and computing a differential value by subtracting the third deviation value from the second deviation value;

determining whether the second deviation value corresponds to one rotation of the motor;

adding or subtracting the number of pulses corresponding one rotation of the motor to or from the second deviation value when the motor has been rotated once in the determining step to obtain the third deviation value and the differential value again and comparing the absolute value of the obtained differential value with the maximum upper limit of noise decision to determine whether noise components are contained in the actual position data, and, comparing the maximum upper limit of noise decision with the absolute value of the differential value of the position data of the motor when the motor has not been rotated once to determine whether noise components are contained in the actual position data of the motor; and,

controlling directly the motor when, at the adding or subtracting step, noise components are not contained in the actual position data of the motor, and, adding or subtracting an objective position deviation value obtained to or from the actual position data when noise components are contained in the actual position data to thereby control the motor.

5,182,507

STEPPING MOTOR DRIVING CIRCUIT HAVING FAILSAFE FUNCTION

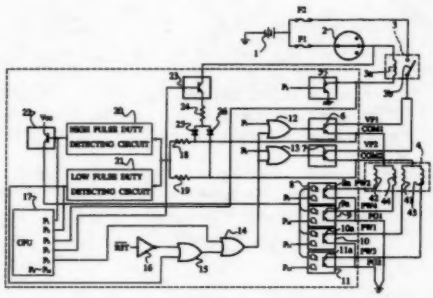
Yukihisa Ishii; Yetsuya Oono, and Shinichi Inagawa, all of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jul. 25, 1991, Ser. No. 735,436

Claims priority, application Japan, Aug. 9, 1990, 2-212231

Int. Cl.[5] G05B *19/40*

U.S. Cl. 318—685 **9 Claims**



1. A driving circuit for driving a stepping motor having a plurality of excitation coils having different phases, comprising:

a plurality of excitation transistors for driving said excitation coils of said stepping motor, respectively;

at least one chopping transistor for effecting chopping control of current flowing to said excitation coils;

a serial circuit comprised of a fault diagnosis transistor and current limiting means;

said serial circuit being connected in parallel with said chopping transistor;

switching control means for selectively turning on and off said fault diagnosis transistor;

output state detecting means for detecting output states of said chopping transistor assumed respectively when said fault diagnosis transistor is turned on and turned off; and

fault detecting means for comparing the detected output levels of said chopping transistor with respective predetermined logic levels and detecting faults in said driving circuit from results of said comparisons.

5,182,508

RECONFIGURABLE AC INDUCTION MOTOR DRIVE FOR BATTERY-POWERED VEHICLE

Colin D. Schauder, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 16, 1992, Ser. No. 870,643

Int. Cl.[5] H02P *7/00*

U.S. Cl. 318—801 **15 Claims**

1. A reconfigurable battery-powered vehicle drive control selectively operable in either a drive mode to supply an AC induction motor or an alternative battery-charging mode, said control comprising:

switching means for providing selective electrical interconnection to operate said control in a drive mode or an alternative battery-charging mode;

reconfigurable inverter means connectable to at least one battery for operation in said drive mode to invert direct current from said battery to a polyphase alternating current to drive said motor, said inverter means further con-

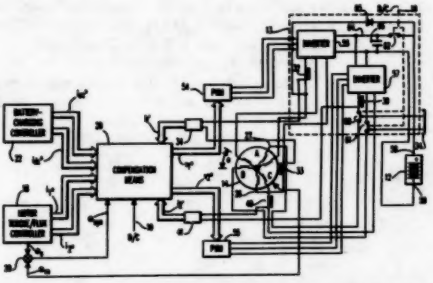
nectable in said alternative battery-charging mode to a source of AC energy for supplying charging current to said battery;

firing circuit means for providing switching signals to operate said reconfigurable inverter means;

a motor torque and flux controller operable in said drive mode to produce at least one drive reference vector signal and a slip angle signal;

a battery-charging controller operable in said alternative battery-charging mode to produce at least two charging reference vector signals; and

reconfigurable compensation means for processing signals



from said controllers, said compensation means including differencing means for use in said drive mode to produce at least one drive error vector signal based on a difference between said at least one drive reference vector signal and a signal representative of actual conditions in said motor, said differencing means for use in said alternative battery-charging mode to produce at least two battery charging error signals based on a difference between said charging reference signals and signals representative of actual charging conditions, said compensation means further including compensators for receiving signals from said differencing means and producing control signals to operate said firing circuit means.

5,182,509

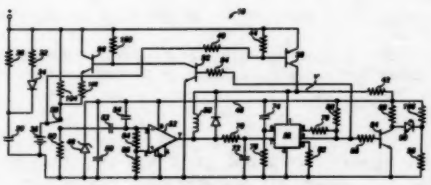
CONDITIONING AND CHARGING CIRCUIT FOR NICKEL-CADMIUM BATTERIES

S. Neil Simmonds, Port Coquitlam, Canada, assignor to 372604 B.C. Ltd., Vancouver, Canada

Continuation-in-part of Ser. No. 503,708, Apr. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 419,866, Oct. 11, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 615,592

Int. Cl.[5] H02J *7/00*

U.S. Cl. 320—14 **14 Claims**



1. A system for conditioning and charging a battery, comprising:

a load resistor;

a charging circuit providing a DC current;

sensor means operatively connected to said battery for sensing the discharge state of said battery, said sensor generating an initiate signal when the rate at which the voltage of said battery decreases during discharge exceeds a predetermined value; and

a control switch operatively connected to said battery, said charging circuit, said load resistor, and said sensor means, said control switch connecting said load resistor to said battery until said sensor means generates said initiate signal thereby discharging said battery, said control switch thereafter connecting said battery to said charge circuit in response to said initiate signal whereby said conditioning and charging system discharges said battery to a predetermined discharge state and then charges said battery.

12. A method of charging a NiCd battery to minimize the detrimental effects of overcharging and memory, said method comprising:

monitoring the voltage from said battery;

discharging said battery until the rate at which the voltage from said battery decreases exceeds a predetermined value; and

charging said battery.

5,182,510

CHARGING SYSTEM

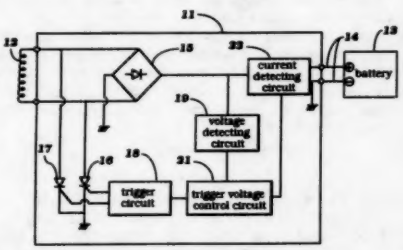
Kazuhiro Nakamura, Shizuoka, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed May 22, 1990, Ser. No. 527,003

Claims priority, application Japan, May 22, 1989, 1-128226

Int. Cl.[5] H02P *9/30*

U.S. Cl. 322—21 **5 Claims**



1. A system for charging a battery from a generator comprising a rectifier regulator for rectifying and regulating the voltage from said generator to charge the battery, cable means interconnecting the output of said rectifier regulator to the battery, said rectifier regulator comprising means for measuring the output voltage of said rectifier regulator, means for measuring the charging current in said cable and means, responsive to inputs received from said output voltage measuring means and from said charging current measuring means, for increasing the voltage output of said rectifier regulator to compensate for the voltage drop in said cable for decreasing the time required to bring the battery to a full state of charge.

5,182,511

DETECTOR CIRCUIT FOR DETECTING A PHASE SIGNAL OF A POLYPHASE ALTERNATOR FOR A BATTERY CHARGE REGULATOR IN A MOTOR VEHICLE, AND UTILIZATION THEREOF

Jean-Marie Pierret, Paris, and Didier Michel, Queue-en-Brie, both of France, assignors to Valeo Equipements Electriques Moteur, Creteil, France

Filed Jul. 11, 1990, Ser. No. 551,624

Claims priority, application France, Jul. 11, 1989, 89 09312

Int. Cl.[5] G01R *31/00;* **H02J** *7/14;* **H01H** *5/20*

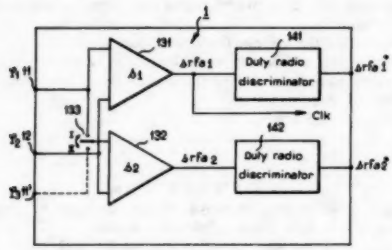
U.S. Cl. 324—158 MG **7 Claims**

1. A detector circuit for detecting a phase signal of a polyphase alternator for a battery charge regulator in a motor vehicle, wherein said circuit includes differential signal ampli-

tude discriminator means for discriminating between at least one pair of phase signals delivered by said alternator, said differential signal amplitude discriminator means including at least:

two input terminals connected respectively to a first and to a second phase of said polyphase alternator, each receiving an alternator phase signal ϕ_1 or ϕ_2; and

threshold comparator means for generating a signal representative of alternator operating conditions when the alternator phase amplitude differential exceeds a determined threshold value, said threshold comparator means including:



a first threshold comparator means, including a first threshold value no greater than 1/20-th of the nominal charge voltage of the battery enabling a first signal representative of alternator operating conditions to be generated when the alternator is rotating at about 1500 rpm. in the absence of alternator excitation current; and

a second threshold comparator means, including a second threshold value no greater than $\frac{1}{4}$ of the nominal battery charge voltage enabling a second signal representative of alternator operating conditions to be generated corresponding to alternator phase voltage regulation conditions.

5,182,512

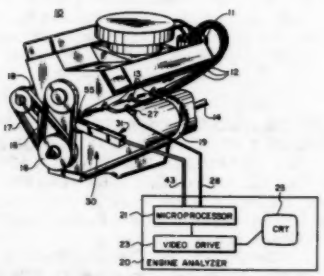
METHOD AND APPARATUS FOR DETERMINING RELATIVE CONTRIBUTIONS OF INDIVIDUAL CYLINDERS OF INTERNAL COMBUSTION ENGINE USING CONTACT TACHOMETER

Robert D. Braun; Matthew M. Crass; James R. Piehl; David J. Schend; Gary S. Wollert, all of Kenosha; Jerry W. Mueckl, Franklin, and Thomas P. Becker, Kenosha, all of Wis., assignors to Snap-on Tools Corporation, Kenosha, Wis.

Filed Oct. 29, 1990, Ser. No. 604,191

Int. Cl.[5] G01P *3/50;* **G01M** *15/00*

U.S. Cl. 324—175 **17 Claims**



1. Apparatus for determining the relative power contributions of individual cylinders of a multi-cylinder internal combustion engine mounted in a vehicle and having an external moving part accessible from outside the engine and which moves at a speed proportional to the speed of the engine, wherein an engine cycle is the time period between consecutive ignition events of the same cylinder, said apparatus comprising: manually operable and portable speed sensing means for detecting the linear speed variations of the external moving part of the engine during an engine cycle and generating an electrical output signal indicative thereof, processing means coupled to said speed sensing means and responsive to said output signal for generating a waveform signal representative of the linear speed variations of the moving part over time, and display means coupled to said processing means for displaying a signal engine cycle of the waveform signal.

5,182,513

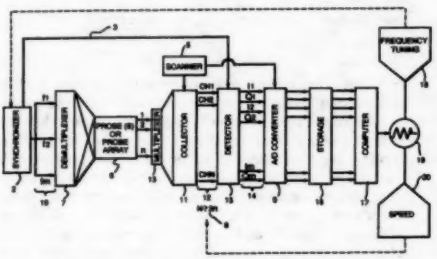
METHOD AND APPARATUS FOR A MULTI-CHANNEL MULTI-FREQUENCY DATA ACQUISITION SYSTEM FOR NONDESTRUCTIVE EDDY CURRENT INSPECTION TESTING

John D. Young, Rexford; Kristina H. Hedengren, Schenectady, and Donna C. Hurley, Albany, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 6, 1991, Ser. No. 696,456

Int. Cl.[5] G01N *27/72, 27/82;* **G01R** *33/12*

U.S. Cl. 324—232 **12 Claims**



1. An eddy current inspection apparatus for detecting flaws in a conductive surface comprising:

a plurality of spatially correlated eddy current probe means;

means for driving select probe means of the plurality with a plurality of select frequencies;

means for automatically scanning in a vicinity of the surface to synchronously acquire discrete scan responsive measurement signals from each of the plurality of probe means;

means for responsively multiplexing each measurement signal onto a predetermined number of independent data channels in order to collect a corresponding plurality of measurement signals for parallel processing;

means for demodulating each measurement signal of the plurality against a reference frequency in order to obtain a corresponding pair of basis components for image processing;

means for converting each component pair into digital format;

automated means for storing the digitized components; and

means for automated parallel image processing of the digital components.

5,182,514

AUTOMATIC COMPENSATOR FOR AN AIRBORNE MAGNETIC ANOMALY DETECTOR

Joseph A. Rice, Jr., Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 19, 1974, Ser. No. 525,340

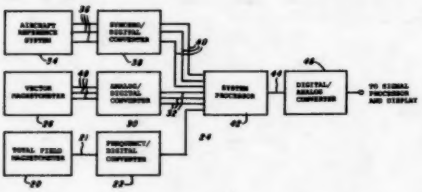
Int. Cl.[5] G01R *33/028, 33/022, 33/24, 33/18*

U.S. Cl. 324—244 **18 Claims**

1. A system for reducing, in an aircraft borne magnetic detector, the effects of time variations in the total magnetic

field caused by maneuvers of the aircraft, said system comprising:

a) means for determining the magnetic properties of said aircraft and storing digital quantities in the form of bi-level electrical signals representative of such properties, and



b) means responsive to the stored digital quantities representative of magnetic properties for producing signals to substantially cancel maneuver related signals in the output of said magnetic detector.

5,182,515

DETECTOR FOR MAGNETISM USING A RESISTANCE ELEMENT

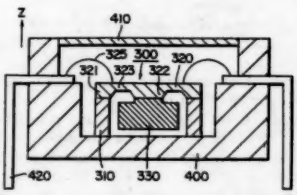
Kazuhiro Okada, Ageo, Japan, assignor to Wacoh Corporation, Ageo, Japan

Division of Ser. No. 295,210, filed as PCT/JP88/00395 on Apr. 22, 1988, Pat. No. 4,967,605. This application Jul. 25, 1990, Ser. No. 559,381

Claims priority, application Japan, Apr. 24, 1987, 62-101267; Apr. 24, 1987, 62-101269

Int. Cl.[5] G01R *33/02*

U.S. Cl. 324—259 **6 Claims**



1. A magnetism detector for detecting magnetism in at least two axial directions in a three-dimensional coordinate system expressed by three axes of X, Y and Z, the detector comprising:

a single crystal substrate having a surface extending along an XY-plane, at least four resistance elements which have a piezo resistance effect such that electric resistance varies due to mechanical deformation of said surface,

a strain generative body having a supporting portion and a working portion, said working portion being displaceable with respect to said supporting portion so as to produce a mechanical deformation of said supporting portion, and

a magnetic body connected to said working portion so as to allow said working portion to undergo a displacement in response to a magnetic force to which said magnetic body is exposed for mechanically deforming said supporting portion,

said substrate being mechanically connected to said supporting portion so that a mechanical deformation of said supporting portion is transmitted to said substrate, and

a bridge circuit being formed by said four resistance elements for detecting said magnetic force in each of two of said axial directions, respectively.

5,182,516

MOLING SYSTEM INCLUDING TRANSMITTER-CARRYING MOLE FOR DETECTING AND DISPLAYING THE ROLL ANGLE OF THE MOLE

Peter Ward, Eastfield Dale, and Stephen J. Glen, Boldon Colliery, both of United Kingdom, assignors to British Gas plc, United Kingdom

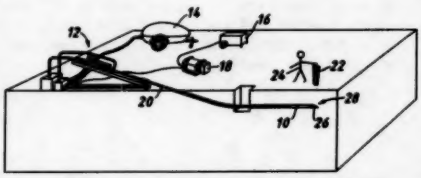
PCT No. PCT/GB90/00892, § 371 Date Jan. 23, 1991, § 102(e) Date Jan. 23, 1991, PCT Pub. No. WO90/15221, PCT Pub. Date Dec. 13, 1990

PCT Filed Jun. 8, 1990, Ser. No. 640,292

Claims priority, application United Kingdom, Jun. 9, 1989, 8913319

Int. Cl.[5] G01V *3/165*; E21B *7/04*

U.S. Cl. 324—326 **13 Claims**



1. A molding system which is capable of giving an indication of mole location and depth comprising a rotatable mole the roll angle of which is required to be known, a radio sonde in the mole having a first transmit coil lying parallel to the lengthwise direction of the mole and a second transmit coil lying transverse to said direction, means indicating a battery and an oscillator for energising the transmit coils with alternating current with a phase difference between the coils, a receiver traversable above ground into a position in which the receiver can give an indication of the roll angle of the mole, and display means, associated with said receiver and located above ground, for displaying said roll angle.

5,182,517

METHOD FOR DETECTING THE MOTION AND POSITION STATE OF A COMPONENT OF AN INDUCTIVE ELECTRIC LOAD, WHICH COMPONENT CAN BE MOVED BETWEEN TWO END POSITIONS BY MEANS OF MAGNETIC INTERACTION

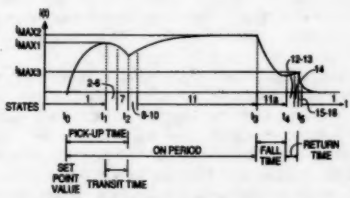
Ulrich Thelen, Esslingen, and Thomas Hirth, Stuttgart, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Dec. 12, 1990, Ser. No. 626,566

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942836

Int. Cl.[5] G01R *31/02*

U.S. Cl. 324—418 **25 Claims**



1. A method for detecting an instantaneous motion and position state of a movable inductive electric load component which is moved between two end positions by magnetic interaction, comprising the steps of:

dividing the total waveform of the drive current of the inductive electric load into a plurality of states which characterize the instantaneous motion and position state of the movable component;

determining a parameter set from at least two parameters assuming binary values, in which a first parameter of the two parameters characterizes a setpoint value of the drive current, the first parameter being the value 1 when the inductive electric load starts to move out of its rest position and being the value 0 when the inductive electric load is at rest and in which the second parameter characterizes a direction of change of the drive current to determine if the drive current is increasing or decreasing the second parameter being the value 1 when the drive current increases and being the value 0 when the drive current is constant or decreasing;

evaluating the change in direction of the drive current as a function of the set point value of the drive current if the inductive electric load is in motion; and

transitioning from a first motion and position state of the inductive electric load into a second motion and position state of the inductive electric load when the values of the parameters the parameter set change

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5,182,518

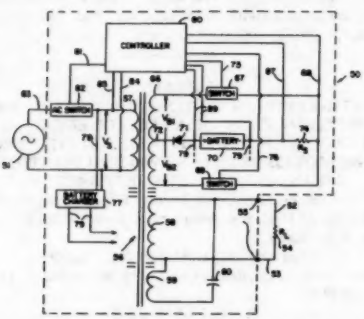
INVERTER AND BATTERY TESTING FOR UNINTERRUPTIBLE POWER SYSTEMS

Frederick A. Stich, Wisconsin Rapids; Richard V. Baxter, Jr., Neenah; Herbert A. Podewils, Sparta, and David L. Layden, New Lisbon, all of Wis., assignors to Best Power Technology, Inc., Necedah, Wis.

Filed Apr. 11, 1991, Ser. No. 685,068

Int. Cl.[5] G01R *31/02, 31/36;* **H02J** *9/04*

U.S. Cl. 324—511 **43 Claims**



1. A method for testing an inverter which receives power from a DC source such as a battery and which is adapted to provide an AC output voltage from the inverter by switching the polarity of the voltage from the DC source, comprising the steps of:

(a) coupling the output of the inverter to a power system which provides an AC voltage to a load so that the voltage provided from the inverter can be applied against the AC voltage waveform from the power system;

(b) turning on the inverter at a test phase corresponding to a chosen point in time after the start of a half-cycle of the AC power system voltage to apply a voltage coupled to the power system which is of the same polarity as the AC voltage waveform at that time and turning off the inverter at a selected point thereafter in the half-cycle of the waveform; and

(c) measuring the current flowing from the inverter during the time it is on such that the measured current can be compared with acceptable values of current to determine whether the inverter is properly functioning.

5,182,519

HEATER CONTROL DEVICE FOR AN AIR-FUEL RATIO SENSOR

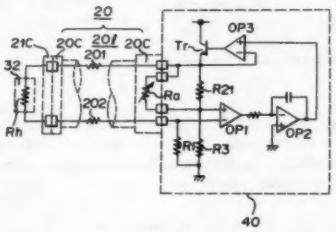
Hiroyoshi Suzuki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1991, Ser. No. 754,853

Claims priority, application Japan, Oct. 22, 1990, 2-285460; Oct. 22, 1990, 2-285461

Int. Cl.[5] G01N *27/58, 27/12*

U.S. Cl. 324—611 **3 Claims**



1. A heater control device for an air-fuel ratio sensor mounted in an exhaust system of an internal combustion engine, said heater control device comprising:

a) a bridge circuit defined by first (Rh), second (R1), third (R21) and fourth (R3) resistances, the first and second resistances being connected in series between a bridge supply terminal and ground, and the third and fourth resistances being connected in series between the bridge supply terminal and ground,

b) current control means (OP1, OP2, OP3, Tr) having inputs individually connected to nodes between the first and second resistances and between the third and fourth resistances, and an output connected to the bridge supply terminal for controlling the current supplied thereto to maintain the bridge circuit balanced,

c) a wiring harness (20) connecting opposite ends of the first resistance to the bridge supply terminal and to the second resistance, and

d) a harness compensating resistance (Ra) connected in parallel with the third resistance,

e) wherein the first resistance is a heater resistance mounted closely proximate the air-fuel ratio sensor, and

f) the second, third and fourth resistances, and the current control means, are disposed within an air-fuel ratio detecting device (40) located outside of an engine compartment.

5,182,520

NON-LINEAR DE-EMPHASIS CIRCUIT

Kaoru Urata, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 27, 1991, Ser. No. 722,161

Claims priority, application Japan, Jun. 29, 1990, 2-173725

Int. Cl.[5] H04B *1/10, 15/00*

U.S. Cl. 328—142 **3 Claims**

1. An apparatus for non-linear de-emphasis of an input signal, comprising:

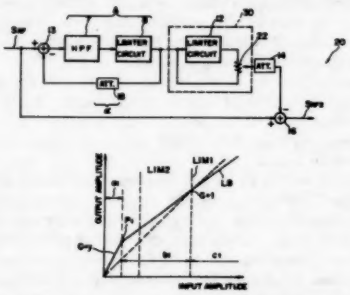
first subtracting means for subtracting an amplitude limiting signal from said input signal so as to produce a first subtracted signal;

high-pass filtering means for extracting high frequency components from said first subtracted signal so as to produce a high frequency signal;

first limiting means having a first amplitude limiting value for amplitude limiting said high frequency signal so as to produce said amplitude limiting signal;

non-linear amplifying means for amplifying, when said amplitude limiting signal has a smaller amplitude than a predetermined value, said amplitude limiting signal with a gain higher than 1, and for amplifying, when the ampli-

tude of said amplitude limiting signal is equal to or higher than said predetermined value, said amplitude limiting signal with a gain less than 1, so as to produce a non-linear amplified signal; and



second subtracting means for subtracting said non-linear amplified signal from said input signal so as to produce a non-linearly de-emphasized signal.

5,182,521

TIME-MULTIPLEXED SWITCHED CAPACITOR CIRCUIT HAVING REDUCED CAPACITANCE

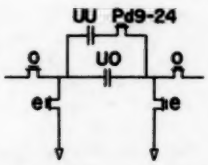
Joseph S. Chang, Clayton, and Yit C. Tong, Burwood, both of Australia, assignors to The University of Melbourne, Parkville, Australia

Continuation of Ser. No. 490,655, filed as PCT/AU88/00331, on Aug. 26, 1988, abandoned. This application Oct. 23, 1991, Ser. No. 782,920

Claims priority, application Australia, Aug. 28, 1987, PI4081

Int. Cl.[5] H03B *1/00*; H03K *5/00*

U.S. Cl. 328—167 **3 Claims**



1. An n-channel Switched Capacitor filter realized as a time multiplexed circuit and operative during n respective time periods to service respective channels of the filter, where n is an integer greater than 1, said filter having an input and an output and comprising:

first and second operational amplifiers, each operational amplifier having an inverting input, a non-inverting input and an output, said filter input being sampled during each of said time periods by the inverting input of said second operational amplifier and said filter output being provided at the output of the second operational amplifier, said output of said second operational amplifier being operatively applied to said inverting input of said first operational amplifier;

a first common capacitor;

a second common capacitor;

an array of n capacitors, respective capacitors of said array corresponding to respective channels of said filter, said array including a first plurality of n_0 capacitors corresponding to n_0 channels and a second plurality of n_1 capacitors corresponding to n_1 channels, where $n_0+n_1=n$;

first means operable during respective time periods corresponding to the n_0 channels for connecting respective capacitors of said first plurality between the output of said first operational amplifier and the inverting input of said second operational amplifier;

second means operable during respective time periods corresponding to the n_0 channels for connecting said first common capacitor between the output of said first operational amplifier and the inverting input of said second operational amplifier, so that during said respective time periods corresponding to the n_0 channels, said first common capacitor is connected in parallel with said respective capacitors of said first plurality;

third means operable during respective time periods corresponding to the n_1 channels for connecting respective capacitors of said second plurality between the output of said first operational amplifier and the inverting input of said second operational amplifier; and

fourth means operable during respective time periods corresponding to the n_1 channels for connecting said first and said second common capacitors between the output of said first operational amplifier and the inverting input of said second operational amplifier, so that during said respective time periods corresponding to the n_1 channels, said first and said second common capacitors are connected in parallel with said respective capacitors of said second plurality, thereby reducing the total capacitance required in said filter.

5,182,522

POLAR LEAPFROG FILTER

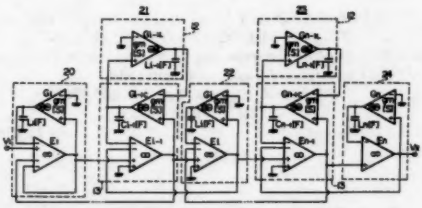
Hiroshi Tanigawa; Hiroshi Kondo; Isao Fukai, and Tsuneo Tohyama, all of Tsurugashima, Japan, assignors to Toko, Inc., Tokyo, Japan

Filed Apr. 3, 1992, Ser. No. 863,205

Claims priority, application Japan, Apr. 10, 1991, 3-103513

Int. Cl.[5] H03F *3/04*

U.S. Cl. 328—167 **4 Claims**



1. A polar leapfrog filter comprising:

at least one polar network which comprises a differentiator constituted by an operational amplifier having input and output terminals, and a first integrator comprising a first capacitor for providing negative feedback to said operational amplifier and a first variable transconductance amplifier, and a second integrator comprising a second capacitor for providing negative feedback to said first integrator and a second variable transconductance amplifier; and

differentiators provided at input and output portions of said filter;

wherein the sum of all circuit units constituting the filter is selected to provide odd order and equal order for the filter; and the circuits are connected to provide leapfrog type negative feedback.

5,182,523
APPARATUS FOR ASCERTAINING THE ALCOHOL CONTENT OR CALORIFIC VALUE OF A MIXTURE BY CAPACITANCE MEASUREMENT

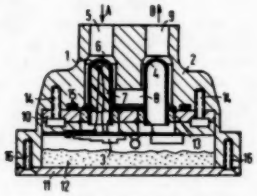
Gernot Ertel, Bischberg, Fed. Rep. of Germany; Ludwig Brabetz, Tournefeuille, France, and Waldemar Schwarz, Schwarzenbruck, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 30, 1991, Ser. No. 753,206

Claims priority, application France, Aug. 30, 1990, 90 11687

Int. Cl.[5] G01R *27/26*; G01N *27/22*

U.S. Cl. 324—663 **9 Claims**



1. An apparatus for ascertaining the alcohol content or the calorific value of a fuel containing a mixture of alcohol and gasoline, comprising:

an electrically conductive housing having inside walls;

a removable plate disposed in said housing, said plate having a fuel side and an exterior side;

said inside walls of said housing and said fuel side of said plate defining a fuel conduit in said housing;

an electronic measuring circuit disposed in said housing apart from said fuel conduit;

an electrically conductive sensor element extending from said plate into said fuel conduit, said sensor element being secured in said plate in an electrically insulated and hermetically sealed manner;

wherein a part of said inside walls forms a first electrode and said sensor element forms a second electrode, said electrodes having a fixed geometric relationship with respect to one another to form a capacitor and being electrically connected with said measuring circuit, the fuel in said fuel conduit serving as a dielectric of said capacitor.

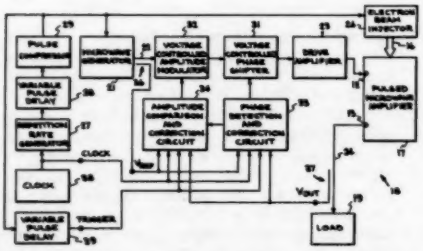
5,182,524
METHOD AND APPARATUS FOR STABILIZING PULSED MICROWAVE AMPLIFIERS

Donald B. Hopkins, Sacramento, Calif., assignor to The Regents of the University of Calif., Oakland, Calif.

Filed Mar. 10, 1992, Ser. No. 850,456

Int. Cl.[5] H03F *1/32*

U.S. Cl. 330—149 **21 Claims**



1. In a method for stabilizing the output of an electron beam driven pulsed microwave amplifier which has a microwave signal input for receiving a low power microwave signal that is to be amplified and which has an output for delivering periodic output pulses of amplified microwave energy to a load, the steps comprising:

sensing at least one characteristic of said low power microwave signal to produce a reference signal that is indicative of said characteristic,

sensing said characteristic in said amplifier output pulses during each of a sequence of output pulses to produce a sequence of output signals that are indicative of said characteristic in said output pulses,

comparing each of said output signals with the reference signal to produce a sequence of error signals that are indicative of variations of said characteristic at said pulsed microwave amplifier output during individual ones of said output pulses,

utilizing said error signals to produce and store a correction signal during each of said sequence of output pulses,

utilizing the correction signals which were stored during prior output pulses to modify said characteristic in said low power microwave signal during subsequent output pulses to suppress said variations during said subsequent output pulses.

5,182,525
CMOS TRANSCONDUCTANCE AMPLIFIER WITH FLOATING OPERATING POINT

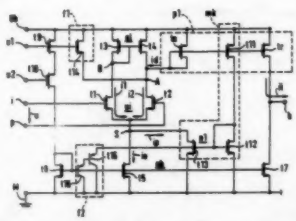
Ulrich Theus, Gundelfingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Dec. 9, 1991, Ser. No. 805,731

Claims priority, application European Pat. Off., Dec. 22, 1990, 90125348.4

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—253 **14 Claims**



1. A CMOS transconductance amplifier that receives a differential input voltage and generates an output current at an output node, comprising:

a voltage-to-current converter having a differential input for receiving said differential input voltage, and having a current output stage comprising an active load, said active load forming a differential current from first and second currents which have a weighting ratio that depends on said input voltage, said differential current being provided at a first junction point, said voltage-to-current converter further including a current feed point; and

an output current mirror having a low-impedance control input coupled to receive said differential current output from said voltage-to-current converter, and having a high-impedance current output formed by the high-impedance current output of an output transistor, said high-impedance current output being connected to said output node to provide a load current;

wherein said transconductance amplifier further includes:

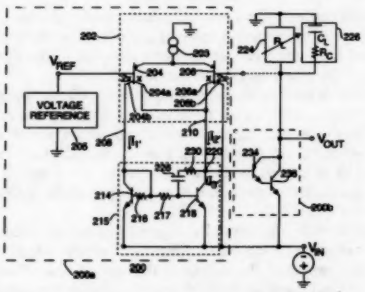
a source that provides a constant quiescent current; and

a positive-feedback circuit having an output that generates an auxiliary current proportional to said load current, said auxiliary current being supplied together with said constant quiescent current to said current feed point of said voltage-to-current converter.

5,182,526
DIFFERENTIAL INPUT AMPLIFIER STAGE WITH FREQUENCY COMPENSATION

Carl T. Nelson, San Jose, Calif., assignor to Linear Technology Corporation, Milpitas, Calif.

Filed Jul. 18, 1991, Ser. No. 732,039
Int. Cl.[5] H03F 3/45
U.S. Cl. 330—257 11 Claims



10. A differential input amplifier stage having first and second input terminals between which a voltage difference can be generated, the stage including:

a differential error amplifier circuit for generating first and second differential currents responsive to a voltage difference generated between the first and second input terminals, said second differential current being shunted;

a current source for providing a current substantially equal to a non-signal component of the first differential current;

an active load coupled to receive the first differential current and the current provided by the current source for generating an error signal current by subtracting from the current provided by the current source a current conducted by the active load in response to the first differential current; and

a frequency compensation circuit coupled to the active load to reduce the gain of the active load with respect to a range of high frequencies, as a result of which the output voltage of the active load becomes less responsive to the first differential current at frequencies within the range of reduced gain.

5,182,527
POWER AMPLIFYING APPARATUS FOR WIRELESS TRANSMITTER

Eiichi Nakanishi, and Tetsuo Onodera, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 672,414, Mar. 20, 1991, Pat. No. 5,126,688.
This application Aug. 13, 1991, Ser. No. 744,393
Claims priority, application Japan, Mar. 30, 1990, 2-80925; Apr. 20, 1990, 2-104775; Apr. 20, 1990, 2-104776; Aug. 10, 1990, 2-213429; Sep. 21, 1990, 2-250065
Int. Cl.[5] H03G 3/30
U.S. Cl. 330—285 2 Claims

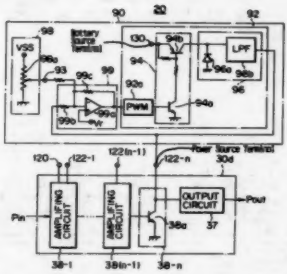
1. A power amplifying apparatus, comprising:

power amplifying means having an input for receiving an input signal and a power source terminal for receiving a D. C. voltage, said power amplifying means for amplifying an amplitude component of the input signal on the basis of the D. C. voltage at said power source terminal; and

voltage stabilizing means having a battery source terminal for connection to a battery for receiving a battery voltage and an output connected to said power source terminal, said voltage stabilizing means for deriving and stabilizing a D. C. voltage from the battery voltage and supplying the stabilized D. C. voltage to said power source terminal in a feedback operation which feeds back and compares the D. C. voltage at said power source terminal with a D. C. reference voltage, wherein said voltage stabilizing means includes:

error detecting means having a first input for receiving the D. C. reference voltage, a second input for receiving the D. C. voltage present at said power source terminal and an output for producing an error difference voltage in dependence of a comparison between the D. C. reference voltage and the D. C. voltage at said power source terminal;

voltage supplying means having an input connected to said battery source terminal for receiving the battery voltage, a further input connected to the output of said error detecting means, and an output constituting the output of said voltage stabilizing means, said voltage supplying means for controlling the battery voltage to produce the stabilized D. C. voltage in dependence of the error difference voltage in a manner that drives the error difference voltage to substantially zero; and

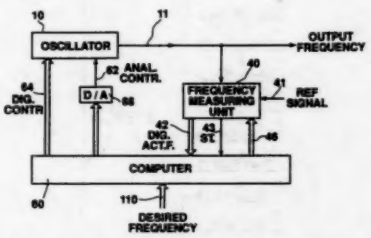


voltage varying means connected to the second input of said error detecting means for adding a selectable D. C. voltage to the stabilized D. C. voltage at said power source terminal for selectively changing the error difference voltage which controls said voltage supplying means and thereby selectively changing the stabilized D. C. voltage.

5,182,528
FREQUENCY SYNTHESIZER HAVING MICROCOMPUTER SUPPLYING ANALOG AND DIGITAL CONTROL SIGNALS TO VCO

Marc Zuta, Petah Tikva, Israel, assignor to Ilatron Ltd., Petah-Tikva, Israel

Filed Nov. 12, 1991, Ser. No. 795,180
Claims priority, application Israel, Nov. 14, 1990, 096351
Int. Cl.[5] H03L 7/085, 7/099
U.S. Cl. 331—1 A 14 Claims



11. A method of controlling an oscillator for generating an output signal having a desired frequency, comprising:

(A) storing in a storage device an oscillator's characteristics in the form of a digital table of the input signals corresponding to a plurality of frequency values, each identified by digital data;

(B) receiving the value of a desired frequency;

(C) computing the values of a coarse-tuning signal and a fine-tuning signal for said oscillator, according to said digital table and said desired signal; and

(D) applying said coarse tuning signal to said oscillator to select one of a plurality of frequency ranges; and applying said fine-tuning signal to said oscillator to select a desired frequency within a selected frequency range.

5,182,529

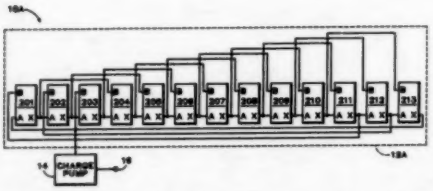
ZERO CROSSING-CURRENT RING OSCILLATOR FOR SUBSTRATE CHARGE PUMP

Wen-Foo Chern, Colorado Springs, Colo., assignor to Micron Technology, Inc., Boise, Id.

Filed Mar. 6, 1992, Ser. No. 847,331

Int. Cl.[5] H03P *5/02*; H03K *3/354*

U.S. Cl. 331—57 **20 Claims**



1. A ring oscillator for use in a charge pump comprising N inverter stages each having a primary input, a secondary input, and an output, wherein N is an odd integer,

the output of each inverter stage is coupled to the primary input of a following inverter stage in a serially-connected ring fashion such that the output of a last inverter stage is coupled to the primary input of a first inverter stage and forms an oscillating signal output, and

the secondary input of each stage is coupled to the output of an Mth preceding inverter stage, wherein M is an odd integer greater or equal to three.

5,182,530

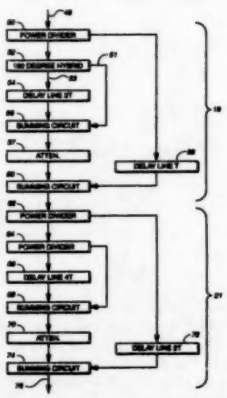
TRANSVERSAL FILTER FOR PARABOLIC PHASE EQUALIZATION

Larry R. Kelly, and Geoffrey S. Waugh, both of Palo Alto, Calif., assignors to Loral Aerospace Corp., New York, N.Y.

Filed Jan. 11, 1991, Ser. No. 639,899

Int. Cl.[5] H03G *11/04*; H03H *7/38*

U.S. Cl. 333—18 **2 Claims**



1. An equalizer operating in the frequency domain for removing parabolic phase distortion from an analog signal, the equalizer comprising:

first analog filter means having a sinusoidal phase response which substantially cancels the parabolic phase distortion, wherein the first filter means has an input coupled to the analog signal and output, and wherein the first filter means is a three tap transversal filter further comprising:

an equao-output power divider having an input and first and second outputs, wherein the input of the power divider is the input of the transversal filter;

a 180 degree hybrid power divider having an input, a noninverting output, and an inverting output, wherein the input of the hybrid power divider is coupled to the first output of the equal-output power divider;

a first delay line having a delay period of T, an input, and an output, wherein the input of the first delay line is coupled to the second output of the equal-output power divider;

a second delay line having a delay period of 2T, an input, and an output, wherein the input of the second delay line is coupled to the noninverting output of the hybrid power divider;

a first summing circuit having first and second inputs and an output, wherein the first input of the first summing circuit is coupled to the output of the second delay line and the second input of the first summing circuit is coupled to the inverting output of the hybrid power divider;

an attenuator for controlling phase having an input and an output, wherein the input of the attenuator is coupled to the output of the first summing circuit; and

a second summing circuit having first and second inputs and an output, wherein the first input of the second summing circuit is coupled to the attenuator output, and the second input of the second summing circuit is coupled to the output of the first delay line, and the output of the second summing circuit is the output of the transversal filter; and

second analog filter means for removing amplitude distortion introduced by the first filter means, wherein the second filter means has an input coupled to the output of the first filter means.

5,182,531

INTERFERENCE PROTECTED ELECTRONIC APPARATUS

Gerhard Fieldler, Neckartailfingen, and Gerhard Conzelmann, Leinfelden-Oberaichen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

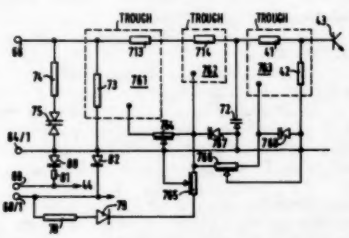
PCT No. PCT/DE89/00039, § 371 Date Apr. 27, 1990, § 102(e) Date Apr. 27, 1990, PCT Pub. No. WO89/07373, PCT Pub. Date Aug. 10, 1989

PCT Filed Jan. 24, 1989, Ser. No. 477,979

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1988, 3802822

Int. Cl.[5] H03H *7/00*

U.S. Cl. 333—167 **30 Claims**



1. Electronic device comprising a signal processing circuit part (4) having signal processing circuit elements, at least one line from an external circuit being connected to said signal processing circuit part (4); and circuit means structured as a

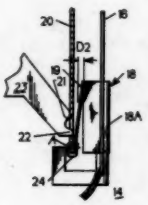
filter circuit (7) and connected electrically to the signal processing circuit part (4) for damping a high-frequency interference voltage induced by an external electromagnetic field, said high-frequency interference voltage having amplitudes greater than a linear control range of the signal processing circuit elements of the signal processing circuit part (4), wherein the circuit means are assigned to the at least one line (6) and are monolithically integrated, said circuit means comprising circuit means components for damping the high-frequency interference voltage and being constructed so that the greater amplitudes of the high-frequency interference voltage do not generate one of a rectified voltage and a rectified current which noticeably shifts operating points of the signal processing circuit elements, at least one of the components (71, 713, 714, 72, 73, 75, 75) of the circuit means being a region introduced into a monocrystalline semiconductor material and forming a p-n junction with the semiconductor material.

5,182,532

THERMAL-MAGNETIC TRIP UNIT

Keith W. Klein, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Feb. 25, 1992, Ser. No. 841,180
Int. Cl.[5] H01H *75/12*
U.S. Cl. 335—35 **23 Claims**



1. A thermal-magnetic trip unit for molded case circuit breakers comprising:

a thermally-responsive electrically-conductive element arranged within an insulative case for connection with a circuit breaker line or load strap;

a stationary magnetically-responsive element at least partially surrounding said electrically-conductive element arranged for providing a magnet force in proportion to current transfer through said electrically conductive element;

a movable magnetically-responsive latching element arranged a predetermined separation distance from said stationary magnetically-responsive element to define a first magnet gap, said movable latching element retaining a circuit breaker releasable element under quiescent current through said electrically-conductive element and releasing a circuit breaker releasable element under a first overload current through said electrically-conductive element; and

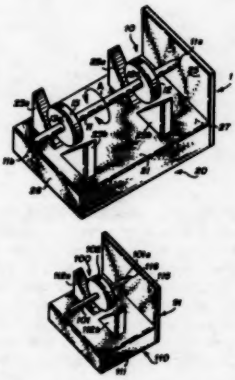
a movable intermediate armature between said stationary magnetically-responsive element and said movable latching element, said intermediate armature thereby moving toward said stationary magnetically-responsive element reducing said magnetic gap and causing said latching element to release said circuit breaker releasable element under a second overload current lower than said first overload current.

5,182,533

MAGNETICALLY LEVITATED SPINNING AXEL DISPLAY APPARATUS

Gary Ritts, Los Angeles, Calif., assignor to CSD, Inc., Carson City, Nev.

Filed Oct. 11, 1991, Ser. No. 775,286
Int. Cl.[5] H02K *7/09*
U.S. Cl. 335—306 **20 Claims**



1. A magnetically levitated spinning axle display apparatus comprising in operative combination:

a) a rod member having a first front end portion and a second rear end portion;

b) a first plurality of magnets disposed spaced apart along said rod member, each of said rod magnets having an axial center aligned coordinate with a longitudinal axis of said rod member:

c) a base member having a first front end portion and a second rear end portion;

d) means for lateral support of only said rod first front end portion, said lateral support means disposed adjacent said base member front end portion; and

e) said base member having a second plurality of magnets disposed spaced apart adjacent an upper surface thereof, each of said second plurality of magnets having a polarity oriented to repulse the polarity of said first plurality of magnets, said second plurality of magnets selectively disposed in substantially coordinate alignment with selected ones of said first plurality of magnets to permit said rod to spin about its longitudinal axis in a levitated state above said base member for prolonged periods with a minimum of drag associated with magnetic frictional forces and rod first end support frictional forces.

18. A magnetically levitated spinning axle display apparatus comprising in operative combination:

a) a rod member having a first front end portion and a second rear end portion;

b) said rod member having a magnet disposed axially mounted along a midportion thereof;

c) a base member having a first front end portion and a second rear end portion;

d) said base member having a base magnet assembly disposed along an upper surface thereof, said base magnet assembly polarized to repulse said magnet mounted on said rod member; and

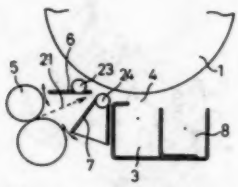
e) means for lateral support of only said rod first front end portion, said lateral support means for keeping said rod member in a substantially horizontal levitated state as an axially rotational movement is imparted to said rod member.

5,182,534

SHEET GUIDING APPARATUS AND AN IMAGE FORMING APPARATUS USING SAME

Yoshinobu Hara, Shinshiro, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 4, 1991, Ser. No. 787,798
Claims priority, application Japan, Nov. 5, 1990, 2-300489
Int. Cl.[5] G30G *21/00*
U.S. Cl. 355—316 **23 Claims**



1. A sheet guiding apparatus for guiding a copy sheet sent from a pair of feed rollers to a transfer station of an image forming apparatus, said sheet guiding apparatus comprising:

first guide means for acting on a first surface of the copy sheet sent from the pair of feed rollers and guiding the copy sheet to the transfer station;

second guide means, confronting said first guide means, for acting on a second surface of the copy sheet sent from the pair of feed rollers and guiding the copy sheet to the transfer station;

support means for supporting said first guide means movable from a first position to a second position, the distance between said first guide means at the second position and said second guide means is narrower than the distance between said first guide means at the first position and said second guide means;

drive means for moving said first guide means between said first position and said second position; and

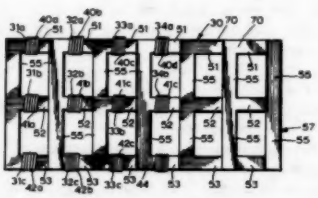
control means for controlling said drive means such that said first guide means locates at said first position when the leading end of the copy sheet is coming toward an interval between said first guide means and second guide means and that said first guide means locates at said second position while the trailing end of the copy sheet is passing through the interval between said first and second guide means.

5,182,535

SUMMING TRANSFORMER CORE FOR STAR-DELTA INVERTER HAVING A SEPARATE SECONDARY WINDING FOR EACH PRIMARY WINDING

P. John Dhyanchand, 2721 Pelham Rd., Rockford, Ill. 61107

Filed Dec. 19, 1989, Ser. No. 452,348
Int. Cl.[5] H01F *33/00*
U.S. Cl. 336—12 **12 Claims**



1. A summing transformer comprising:

a core comprising first and second core sections, each of the core sections comprising first, second, and third principal legs;

a first set of primary windings comprised of primary windings that are wrapped about the principal legs of the first core section, are connected to each other in wye configuration, and are not directly connected to windings from any other set of windings;

a second set of primary windings comprised of primary windings that are wrapped about the principal legs of the second core section, are connected to each other in delta configuration, and are not directly connected to windings from any other set of windings; and

a group of secondary windings comprised of three sets of secondary windings that are connected to each other in wye configuration and are not directly connected to windings from any other set of windings;

the first set of secondary windings being comprised of secondary windings that are wrapped about the first principal legs of each of the core sections and are connected in series;

the second set of secondary windings being comprised of secondary windings that are wrapped about the second principal legs of each of the core sections and are connected in series; and

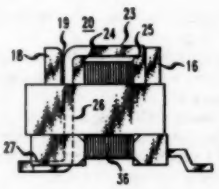
the third set of secondary windings being comprised of secondary windings that are wrapped about the third principal legs of each of the core sections and are connected in series.

5,182,536

SURFACE MOUNT CURRENT TRANSFORMER STRUCTURE

Jeffrey J. Boylan, Dallas, and Lennart D. Pitzele, Rockwall, both of Tex., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 1, 1992, Ser. No. 907,088
Int. Cl.[5] H01F *27/30*
U.S. Cl. 336—65 **10 Claims**



1. A power conversion transformer comprising:

a bobbin having a base platform, first and second end walls extending from said base platform, an interior wall formed adjacent to said first end wall to form a well, and a secondary winding armature disposed between said interior wall and said second end wall;

a secondary wire winding wrapped on said armature; and

an insert element constituting the primary winding of said transformer comprising:

two elongate legs disposed in said well and a flange bent at substantially right angles to said legs, the flange having a flat top surface exterior to said right angle to serve as a pick-up surface for vacuum pick-and-place equipment; and

the underside of said flange being disposed in close proximity to a section of said secondary winding, and being supported on the top edge of said interior well.

5,182,537

TRANSFORMER WITH TWISTED CONDUCTORS

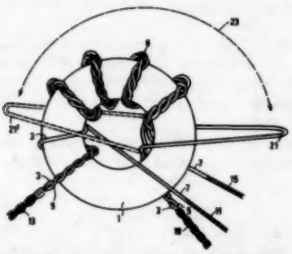
Robbert C. Thuis, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1991, Ser. No. 749,803

Claims priority, application Netherlands, Sep. 12, 1990, 9002005

Int. Cl.[5] H01F 27/30

U.S. Cl. 336—180 4 Claims



1. A transformer, comprising an annular core (1) of a soft-magnetic material with a first and a second winding, each of which consists of at least one wire-shaped electrical conductor (3, 5, 7), which conductors are twisted over at least a part of their length in order to form a cable (9) which is wound around the core (1), the first winding comprising n turns more than the second winding, characterized in that the first winding consists of a first (3) and a second conductor (5), the second winding consisting of a third conductor (7), the three conductors being twisted into a cable (9) over a length which is necessary to form at least a part of the second winding, from the cable there being formed a commonly wound winding which includes said part, near one end of the common winding there being provided n additional turns of the first conductor (3) whilst near the other end of the common winding there are provided n additional turns of the second conductor (5), the corresponding end portions of the first and the second conductor being electrically interconnected in order to form terminals (13, 19) of the first winding, the end portions of the third conductor (7) forming terminals (11, 15) of the second winding.

5,182,538

BIMETAL THERMOSWITCH

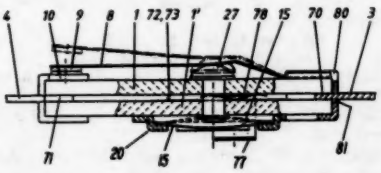
Manfred K. Müller, Pforzheim, Fed. Rep. of Germany, assignor to Limitor AG, Zurich, Switzerland

Continuation of Ser. No. 582,136, Sep. 12, 1990, abandoned, which is a continuation of Ser. No. 305,948, Feb. 2, 1989, abandoned, which is a division of Ser. No. 86,087, Aug. 27, 1987, Pat. No. 4,847,587. This application Apr. 17, 1991, Ser. No. 686,843

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539425

Int. Cl.[5] H05K 1/16; H01H 37/52

U.S. Cl. 337—102 49 Claims



1. A bimetal thermoswitch comprising:

an electrically insulating flat carrier formed of a thin alumina ceramic slab;

at least two electrical terminals connected to said carrier in an electrically isolated configuration;

a fixed electrical contact connected to a first of said electrical terminals;

a contact spring having one end connected to a second of said electrical terminals, said contact spring having an electrical contact element disposed on an opposite end;

bimetal element means for moving said contact spring in a direction transverse to the plane of said carrier in response to changes in temperature;

a shunt resistor connected at one end to said fixed contact and at another end to said second of said electrical terminals; and

a series resistor connected at one end to said contact spring and at another end to said second of said electrical terminals.

5,182,539

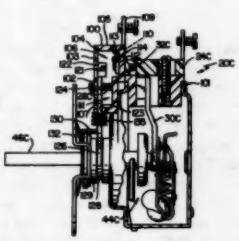
TEMPERATURE OPERATED SWITCH CONSTRUCTION, TERMINAL BLOCK THEREFOR AND METHODS OF MAKING THE SAME

Thomas M. Buckshaw, Indiana; Joseph J. Erdelsky, Jeannette, and David M. Martin, Dunbar, all of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Continuation-in-part of Ser. No. 688,157, Apr. 19, 1991. This application Apr. 14, 1992, Ser. No. 869,160

Int. Cl.[5] H01H 37/36, 37/64

U.S. Cl. 337—310 18 Claims



1. In a temperature operated switch construction comprising a housing means, a first movable switch arm carried in said housing means, temperature actuated means disposed in said housing means and being operatively interconnected to said first switch arm to cause movement of said first switch arm between operating positions thereof in relation to the temperature being sensed by said temperature actuated means, said housing means comprising a main part and a removable terminal block carried by said main part, said terminal block carrying a first switch means that is operatively associated with said first switch arm so that said first switch means is in a first condition thereof when said first switch arm is in a first operating position thereof and said first switch means is in a second condition thereof when said first switch arm is in a second operating position thereof, said switch construction comprising a second movable switch arm carried by said housing means and being operatively interconnected to said second switch arm to cause movement of said second switch arm between operating positions thereof in relation to the condition of said actuator means, and a second removable terminal block carried by said main part of said housing means, said second terminal block carrying a second switch means that is operatively associated with said second switch arm so that said second switch means is in a first condition thereof when said second switch arm is in a first operating position thereof and said second switch means is in a second condition thereof when said second switch arm is in a second operating position thereof, the improvement wherein said first switch means comprises a first reed switch means and wherein said first

switch arm carries a first magnet means for operating said first reed switch means to said conditions thereof as said first switch arm is moved to said positions thereof, said second switch means comprising a second reed switch means, said second switch arm carrying a second magnet means for operating said second reed switch means to said conditions thereof as said second switch arm is moved to said positions thereof in a direction that is generally parallel to said second reed switch means.

5,182,540

ELECTRICAL RESISTOR ELEMENT AND METHOD OF MANUFACTURING THE SAME

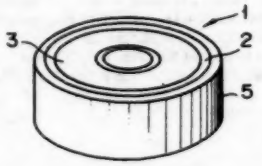
Naoki Shuto; Fumio Ueno, both of Yokohama; Yoshiko Goto, Tokyo; Akihiro Horiguchi; Mitsuo Kasori, both of Kawasaki, and Motomasa Imai, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 28, 1991, Ser. No. 662,628

Claims priority, application Japan, Feb. 28, 1990, 2-47501; Dec. 27, 1990, 2-407972

Int. Cl.[5] H01C *8/00, 7/10*

U.S. Cl. 338—223 **17 Claims**



1. An electrical resistor element, comprising a sintered body containing a ferrite ceramic material of a spinel structure represented by the chemical formula $Me_xFe_{3-x}O_4$, where Me denotes a metal element, and x is $0<x<3$; and electrode means mounted to said sintered body, said sintered body consisting essentially of the main component of $Me_xFe_{3-x}O_4$ and oxide material selected from the group consisting of (1) 0.005T to 2.0% by weight of bismuth oxide calculated in terms of Bi_2O_3, (2) 0.01% to 3.0% by weight and a combination 0.005% to 2.0% by weight of silicon oxide and aluminum oxide calculated in terms of SiO_2 and Al_2O_3, respectively, and (3) a combination of 0.01% to 3.5% by weight and 0.001% to 1.6% by weight of silicon oxide and calcium oxide calculated in terms of SiO_2 and CaO, respectively.

5,182,541

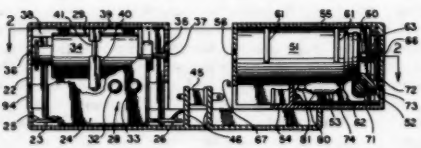
REMOTE CONTROLLED THEFT DETERRENT SYSTEM

Jay E. Bajorek, Wadsworth; Austin E. Cox, Medina; Eugene S. Kovack, Wadsworth; Michael S. Lionetti, Wadsworth, and Joe Smisko, Wadsworth, all of Ohio, assignors to Concept Five, Inc., Wadsworth, Ohio

Filed Feb. 28, 1992, Ser. No. 843,211

Int. Cl.[5] B60R *25/00;* **G08B** *15/02*

U.S. Cl. 340—428 **12 Claims**



1. An apparatus for minimizing loss from an unauthorized entry into an enclosure, comprising:

circuit means for detecting unauthorized entry into the enclosure;

a noxious gas capable of rendering the enclosure temporarily uninhabitable by humans;

canister means for holding said noxious gas and selectively delivering said noxious gas into said enclosure, said canister means including valve means for controlling said selective delivery of said noxious gas therefrom, and further including solenoid means for selectively operating said valve means to deliver said noxious gas;

control means for monitoring said circuit means and triggering the delivery of said noxious gas into said enclosure by said canister means upon an unauthorized entry into the enclosure;

remote control means for generating a wireless signal for selectively arming and disarming said control means, said control means including receiver means for receiving said wireless signal and selectively arming and disarming the device; and

safety means for precluding the inadvertent delivery of said noxious gas from said canister means into the enclosure.

5,182,542

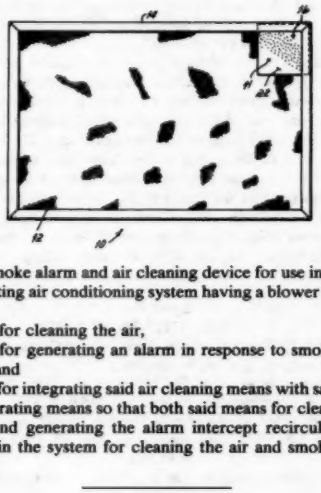
SMOKE ALARM AND AIR CLEANING DEVICE

Roger Adelman, Cincinnati, and Michael S. Duty, New Richmond, both of Ohio, assignors to Newtron Products Company, Cincinnati, Ohio

Filed Jul. 2, 1991, Ser. No. 724,872

Int. Cl.[5] G08B *19/00;* **B01D** *19/00*

U.S. Cl. 340—521 **29 Claims**



1. A smoke alarm and air cleaning device for use in a forced recirculating air conditioning system having a blower comprising:

means for cleaning the air,

means for generating an alarm in response to smoke in the air, and

means for integrating said air cleaning means with said alarm generating means so that both said means for cleaning the air and generating the alarm intercept recirculating air within the system for cleaning the air and smoke detection.

5,182,543

MINIATURIZED DATA COMMUNICATION AND IDENTIFICATION SYSTEM

Marvin Siegel, East Lansing; William Donohue, Haslett, both of Mich., and Michael J. Francois, Cedar Rapids, Iowa, assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Sep. 12, 1990, Ser. No. 581,366

Int. Cl.[5] G08B *1/00;* **H04B** *10/00*

U.S. Cl. 340—531 **16 Claims**

1. A communications unit comprising:

an identification unit for entering a user specified identification code;

a clock circuit for generating a digital time signal indicative of the current time;

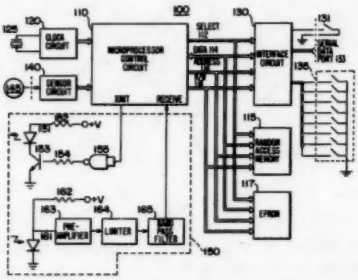
a writable memory;

a transmitter for producing an encoded radiant energy transmission at a predetermined wavelength;

a radiant energy receiver for receiving encoded radiant energy transmissions at said predetermined wavelength;

a control circuit connected to said identification unit, said clock circuit, said writable memory, said transmitter and said radiant energy receiver operative to

decode the radiant energy transmissions received by said receiver thereby producing decoded data,



store said decoded data and the current digital time signal within said writable memory for each encoded radiant energy transmission in the order of receipt, and

control said transmitter to produce said radiant energy transmission encoded with said identification code at varying intervals of time randomly selected within a predetermined range of time.

5,182,544

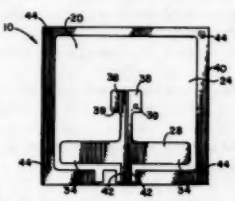
SECURITY TAG WITH ELECTROSTATIC PROTECTION

Luis Aquilera, Guanica, P.R.; Lawrence C. Appalucci, Villanova, Pa., and Gary Mazoki, Sewell, N.J., assignors to Checkpoint Systems, Inc., Thorofare, N.J.

Filed Oct. 23, 1991, Ser. No. 780,588

Int. Cl.[5] G08B *13/14*; H02H *3/00*

U.S. Cl. 340—572 **14 Claims**



1. A security tag for use with an electronic article surveillance system comprising:

a flexible, substantially planar dielectric substrate having a first side and a second side;

a first conductive pattern positioned on the first side of the substrate;

a second conductive pattern positioned on the second side of the substrate, the first and second conductive patterns cooperating to establish a resonant circuit including at least one inductive element and at least one capacitive element having first and second generally separated plates; and

a conductive frame member positioned on the substrate and extending around at least a portion of one of the conductive patterns, the conductive frame member establishing an electrical connection between the first and second plates of said at least one capacitive element to prevent said at least one capacitive element from charging to thereby provide electrostatic discharge protection for the security tag.

5,182,545

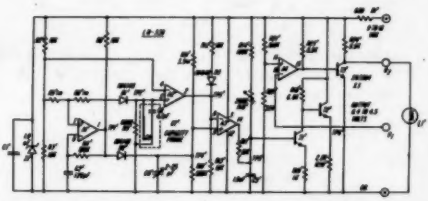
FLUID LEVEL SENSOR HAVING CAPACITIVE SENSOR

Lewis E. Goekler, Cincinnati, and Edward R. Chamberlin, Loveland, both of Ohio, assignors to Standex International Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 294,200, Jan. 6, 1989, Pat. No. 5,017,909. This application Apr. 24, 1991, Ser. No. 690,502

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—620 **5 Claims**



1. A fluid level detector for detecting the level of a liquid contained within a receptacle having an electrically conductive portion, comprising:

a probe mounted in said receptacle and electrically insulated from said receptacle, said probe acting as a first plate of a capacitor and being cooperative with said electrically conductive portion of said receptacle acting as a second plate of said capacitor, the liquid in the receptacle acting as a dielectric between said first plate and said second plate of said capacitor to produce a sensor capacitor having a capacitance which varies in magnitude in accordance with the level of liquid contained within the receptacle;

detecting circuitry coupled to said probe and responsive to a difference between a voltage decay signal derived from said sensor capacitor and a reference voltage decay signal derived from a reference capacitor to provide an output signal when a predetermined voltage difference is detected therebetween; and

indicating means coupled to said detection circuitry and responsive to said predetermined voltage difference as detected by said detection circuitry to provide an indication of the level of liquid contained within the receptacle.

5,182,546

ELECTRONIC APPARATUS WHICH CAN DISCRIMINATE BETWEEN DIFFERENT POWER SOURCES WHICH IT USES

Kenichi Shinbori; Nasaya Maeda, and Yuji Sakaegi, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 307,328, Feb. 6, 1989, abandoned. This application Dec. 13, 1991, Ser. No. 808,951

Claims priority, application Japan, Feb. 12, 1988, 63-03033; Feb. 12, 1988, 63-030335; May 7, 1988, 63-111249

Int. Cl.[5] G08B *21/00*

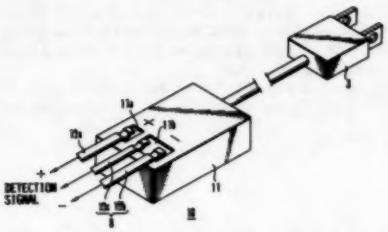
U.S. Cl. 340—636 **29 Claims**

1. An electronic apparatus capable of individually using one of at lest two power source units having electrode means with respective different characteristics and providing sensible indication of which of such two power source units is disposed in said apparatus, comprising:

A) a single power source unit compartment capable of accommodating each of said power source units individually; and

B) detecting means disposed in said power source unit compartment and adapted for detecting respective patterns of

configuration of connecting electrode means of each said power source unit when accommodated in said power source unit compartment, said detection being sensible



exteriorly of said apparatus and being of respective different detection characteristics correspondingly with said respective patterns of configuration.

5,182,547

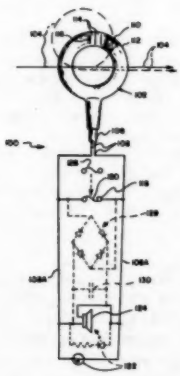
NEUTRAL WIRE CURRENT MONITORING FOR THREE-PHASE FOUR-WIRE POWER DISTRIBUTION SYSTEM

David C. Griffith, Chagrin Falls, Ohio, assignor to High Voltage Maintenance, Dayton, Ohio

Filed Jan. 16, 1991, Ser. No. 641,679

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—664 **20 Claims**



1. Current monitoring apparatus for detecting at least one defined current level in a neutral circuit of a three-phase four-wire electric power distribution system, said current monitoring apparatus comprising:

current transformer means coupled to said neutral circuit for generating a current signal representative of current flowing through said neutral circuit;

fuse means connected in shunt across said current transformer means for conducting current signals up to a current rating of said fuse means; and

alarm means connected in shunt across said fuse means for alerting personnel operating said power distribution system upon operation of said fuse means in response to current signals exceeding the current rating of said fuse means.

5,182,548

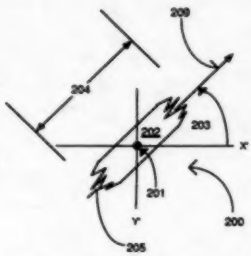
METHOD AND APPARATUS FOR PAINTING ON A COMPUTER

Paul E. Haeberli, Menlo Park, Calif., assignor to Silicon Graphics, Inc., Mountain View, Calif.

Filed Jan. 10, 1990, Ser. No. 464,025

Int. Cl.[5] G09G *3/02*

U.S. Cl. 340—706 **4 Claims**



1. A method of painting in a computer controlled video display system, comprising the steps of:

(a) determining a current shape of a brush stroke, wherein the brush stroke is a representation of an image to be displayed on the display system;

(b) determining a current direction of the brush stroke;

(c) determining a current position on a first image;

(d) setting a current size of the brush stroke based on a current velocity of the movement of a user-actuated input device;

(e) automatically setting a current color equal to a color at the current position on the first image; and

(f) placing a copy of a brush image into a second image, wherein the brush image has a same shape as the brush stroke, comprising the steps of:

(i) setting a color of the brush image equal to the current color;

(ii) setting a position of the brush image equal to the current position;

(iii) setting a direction of the brush image equal to the current direction of the brush stroke; and

(iv) setting a size of the brush image equal to the current size of the brush stroke.

(g) determining a next position of a brush stroke on the first image;

(h) setting an instantaneous velocity based on a distance between the current position and the next position;

(i) setting the current velocity equal to a sum of a weighted value of the current velocity and a weighted value of the instantaneous velocity;

(j) setting the current position equal to the next position;

(k) if a user wishes to continue to paint, then repeating steps (d) through (j).

5,182,549

LIQUID CRYSTAL APPARATUS

Osamu Taniguchi, Chigasaki; Hiroshi Inoue, Yokohama; Atsushi Mizutome, Fujisawa; Tadashi Mihara, Atsugi; Yoshihiro Onitsuka, Yokohama, and Masahiro Terada, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1988, Ser. No. 164,504

Claims priority, application Japan, Mar. 5, 1987, 62-51775; Mar. 31, 1987, 62-78003; Jun. 8, 1987, 62-143874; Jul. 27, 1987, 62-188298

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—784 **17 Claims**

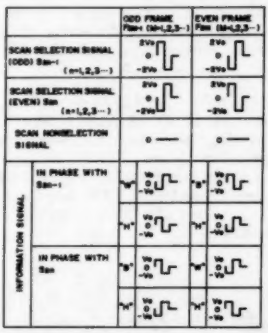
1. In a liquid crystal apparatus, comprising scanning electrodes and data electrodes intersecting each other to form a pixel at each intersection, a liquid crystal assuming a first optical state and a second optical state according to the polar-

ity of a writing voltage applied thereto and disposed between the scanning electrodes and data electrodes, scanning-side drive means connected to the scanning electrodes, and data-side drive means connected to the data electrodes, the improvement wherein:

said scanning-side drive means includes means for supplying first and second scanning selection signals having mutually different voltage waveforms to the scanning electrodes, so that both the first and second scanning selection signals are applied to the scanning electrodes in one vertical scanning period, and a particular scanning electrode is supplied with both the first and second scanning selection signals in a first and a second vertical scanning period;

said data-side drive means including means for supplying data pulses to the data electrodes in synchronism with the first and second scanning selection signals;

said scanning-side drive means and data-side drive means, in combination,



(i) in the first vertical scanning period, applying a first writing voltage to a first selected pixel on a first scanning electrode in response to receiving the first scanning selection signal so as to cause the first selected pixel to assume the first optical state, and applying a second writing voltage to a second selected pixel on a second scanning electrode in response to receiving the second scanning selection signal so as to cause the second selected pixel to assume the second optical state, and

(ii) in the second vertical scanning period, applying a first non-writing voltage of an opposite polarity to the first writing voltage to the first selected pixel on the first scanning electrode in response to receiving the second scanning selection signal, and applying a second non-writing voltage of an opposite polarity to the second writing voltage to the second selected pixel on the second scanning electrode in response to receiving the first scanning selection signal.

5,182,550

INTER-NETWORK CONNECTION SYSTEM

Toru Masuda, Fujisawa, and Akinori Kamijo, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 271,409, Nov. 14, 1988, abandoned, which is a continuation of Ser. No. 865,822, May 22, 1986, abandoned. This application Aug. 1, 1990, Ser. No. 563,673

Claims priority, application Japan, May 31, 1985, 60-116807

Int. Cl.[5] H04J *3/08*

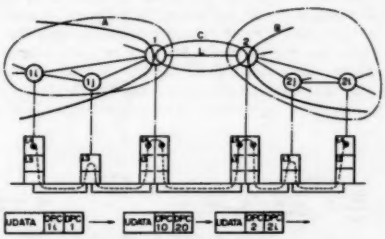
U.S. Cl. 340—825.05 **4 Claims**

1. A inter-network connection system for interconnecting a plurality of independent common channel signaling networks, said connection system comprising:

a plurality of independent common channel signaling networks wherein each of said independent common channel signaling networks comprises one or more signaling offices identified by corresponding office numbers and each signaling network has a signaling code that is independent of the other independent common channel signaling networks so that a given office number can be assigned to signaling offices in different independent common channel signaling networks, and in each of said independent common channel signaling networks, one of said signaling offices being connected to function as a gate way office; and

a local signaling network comprising a point to point system including at least two gateway offices of respective ones of said independent common channel signaling networks, each of said gateway offices including:

means for transmitting a signal unit comprising at least user data, an originating office code, and a destination office code, from one of said independent common channel signaling networks to another one of said independent common channel signaling networks, and each of said independent common channel signaling networks including:



one of said signaling offices corresponding to an originating office and including means for setting the user data, the originating office code and the destination office code in the signal unit and for sending the signal unit to the gateway office in said one of said independent common channel signaling networks, the gateway office in said one of said independent common channel signaling networks including:

first changing means for changing the signal unit by selecting at least one of an originating office code and a destination office code on the basis of the user data so as to identify the gateway office of said another independent common channel signaling network and for transmitting the signal unit through said local signaling network including both gateway offices, and the gateway office in said another one of said independent common channel signaling networks including:

said changing means for changing the signal unit by selecting at least one of an originating office code and a destination office code on the basis of the user data so as to identify a termination office and for transmitting the signal unit to the termination office.

5,182,551

REMOTE CONTROL SYSTEM FOR AUDIO/VIDEO DEVICES

Takeshi Goto, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 514,834, Apr. 26, 1990, abandoned. This application Jan. 28, 1992, Ser. No. 825,846

Claims priority, application Japan, Apr. 27, 1989, 1-108852; Dec. 20, 1989, 1-330577

Int. Cl.[5] H04Q *1/00*

U.S. Cl. 340—825.24 **8 Claims**

3. A remote control system for controlling at least two electronic devices each connected with the other devices through information transmission paths and having an identifying address, at least more than two individual predetermined

operating modes, and at least more than one operational actuator which is operable by an operator to transmit a remote control signal consisting of either an operational signal for controlling the operation of each of the devices or a designation signal for designating one of the identified devices to be controlled by the operational signal, each of the devices comprising:

a receiver for receiving the remote control signal;

a control means for controlling the operation of the device in connection with the predetermined mode upon receiving the signal from the receiver; and

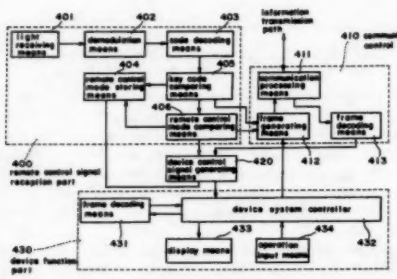
a communication means for transmitting the signal from the receiver to the other devices through the paths,

said receiver including:

a first demodulation means having a specific signal arrangement stored therein, said specific signal arrangement being compared with the signal arrangement of the signal unit received by the receiver so as to output a signal indicating the agreement or disagreement therebetween;

a second demodulation means for judging, upon receiving the agreement signal from the first demodulation means, whether or not the device select signal of the signal unit is directed to the device having the receiver so as to output a signal indicating the identity or non-identity thereof;

a data code process means for judging, upon receiving the disagreement signal from the first demodulation means, whether or not the control command of the device control signal of the signal unit is a kind of command common to



the other devices to output a signal indicating whether the command is common or special;

a first format converting means for converting, upon receiving the disagreement signal from the first demodulation means or the special signal from the data code process means, the signal unit of the transmitter to an equivalent transfer signal for transferring through the information transmitting paths;

a second format converting means for converting, upon receiving the command signal from the data code process means, the signal unit of the transmitter to a control command for operating the designated device;

a frame generating means for forming the equivalent transfer signal into a first transfer signal for transferring toward all of the other devices through the information transmitting paths, and for forming the control command into a second transfer signal for transferring toward the designated device through the information transmitting paths; and

a system control means for controlling, upon receiving the identity signal from the second demodulation means, the operation of the device on the basis of the device control signal of the signal unit; and

the other devices each comprising:

a frame decode means for judging whether or not the transfer signal from the frame generating means of the device is a common command to output a signal indicating whether the command is common or special;

a first format counter conversion means for converting the transfer signal to the original signal unit in a counter, upon receiving the special signal from the frame decode means;

a second format counter conversion means for judging whether or not the signal unit from the first format counter conversion means has a specific signal arrangement relating to each of the other devices to output a signal indicating the agreement or disagreement therebetween;

a format counter conversion means for neglecting, upon receiving the disagreement signal from the second format counter conversion means, the signal unit, and for judging, upon receiving the agreement signal from the second format counter conversion means, whether or not the signal unit is directed to each of the other devices to output a signal indicating the identity or non-identity thereof; and

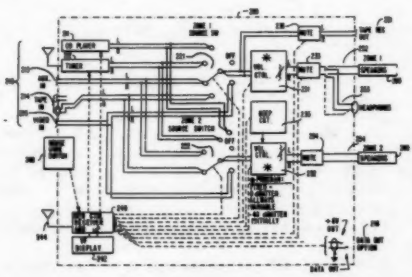
a system control means for neglecting, upon receiving the non-identity signal from the format counter conversion means, the signal unit, and for controlling, upon receiving one of the identity signal from the format counter conversion signal and the common signal from the frame decode means, the operation of the designated device on the basis of the device control signal of the signal unit.

5,182,552

MULTIPLE ZONE AUDIO SYSTEM

Richard J. Paynting, Cumberland, R.I., assignor to Bose Corporation, Framingham, Mass.

Continuation of Ser. No. 398,071, Aug. 24, 1989, abandoned.
This application Dec. 7, 1990, Ser. No. 625,647
Int. Cl.[5] G05B *19/00*
U.S. Cl. 340—825.25 **15 Claims**



1. Apparatus for controlling multiple program signals in an audio system comprising,

a central unit at a central location having a plurality of program source inputs for receiving a corresponding plurality of audio input signals,

said central unit having at least two central unit outputs for receiving selected ones of the audio signals applied to said program source inputs,

said central unit having at least two central unit selectors for independently selecting from said program source inputs to simultaneously deliver different selected ones of audio input signals on said program source inputs to respective ones of said central unit outputs,

said central unit having a central unit controller controlling said selectors,

said central unit having a central unit interface to said central unit controller having at least a source selection input and at least a general functional input corresponding to control functions associated with signals delivered to said outputs,

said central unit having a central unit receiver,

said central unit interface being coupled to said central unit receiver for receiving signals modulated with selection and control signals for controlling said control functions,

a remote interface comprising a hand-held transmitter that

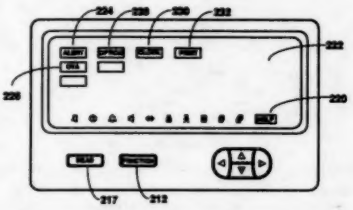
radiates a carrier signal to said central unit receiver modulated with said selection and control signals so that an operator in a location remote from said central location may remotely operate said control unit selectors and said control functions.

5,182,553

COMMUNICATION RECEIVER PROVIDING DISPLAYED OPERATING INSTRUCTIONS

Patrick S. Kung, West Palm Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 4, 1990, Ser. No. 576,742
Int. Cl.[5] H04Q *7/00*
U.S. Cl. 340—825.44 **22 Claims**



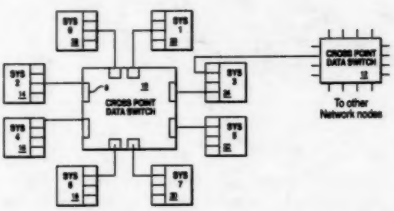
1. A communication receiver, comprising:
receiving means for receiving selective call signals including messages, and further for receiving a receiver operating instruction;
control means for controlling a receiver function;
memory means for storing the received receiver operating instruction which describes the operation of the receiver function being controlled;
retrieval means for recalling the stored receiver operating instruction; and
presentation means for presenting the received messages, and further for presenting the recalled operating instruction.

5,182,554

THIRD PARTY EAVESDROPPING FOR BUS CONTROL

John M. Kaiser, Cedar Park, and Joe C. St. Clair, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1990, Ser. No. 629,864
Int. Cl.[5] H04B *1/00*
U.S. Cl. 340—826 **16 Claims**



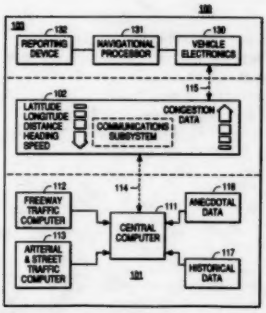
1. A communication system for providing a continuous communications channel between two of a plurality of data processing system elements, said system comprising:
an information bus;
a plurality of ports, each port connected to at least one unique data processing system element and to said information bus, each port including control means for requesting or granting a channel connection with another of said ports; and
switch means connected to said information bus and each of said ports for establishing said continuous communications channel between a requesting port and a granting port in response to a grant from the granting port.

5,182,555

CELL MESSAGING PROCESS FOR AN IN-VEHICLE TRAFFIC CONGESTION INFORMATION SYSTEM

Roy L. Sumner, Vienna, Va., assignor to Farradyne Systems, Inc., Rockville, Md.

Filed Jul. 26, 1990, Ser. No. 557,742
Int. Cl.[5] G08G *1/09*
U.S. Cl. 340—905 **15 Claims**



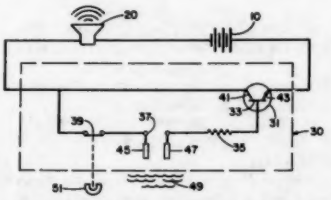
1. In an in-vehicle traffic congestion information system, a method for cell messaging comprising the steps of:
inputting raw traffic congestion data from at least one source of traffic congestion data,
processing said raw traffic congestion data to produce a at least one traffic congestion data message indicative of a level of traffic congestion for a predetermined section of roadway and direction of travel,
transmitting said at least one traffic congestion data message if the level of traffic congestion for said predetermined section of roadway and direction of travel exceeds a predetermined congestion level,
receiving said at least one traffic congestion data message in a vehicle,
determining the location and heading of the vehicle, and
reporting said at least one traffic congestion data message if said section of roadway and direction of travel are within a predetermined area defined by the location and heading of the vehicle.

5,182,556

DRAIN PLUG ABSENCE INDICATOR

Gerald N. Plost, 1729 E. 19th, Tulsa, Okla. 74104, and Henry A. Hodgson, 1410 E. 33rd, Tulsa, Okla. 74105

Filed Mar. 28, 1991, Ser. No. 676,871
Int. Cl.[5] G08B *23/00*; B63B *13/00*
U.S. Cl. 340—984 **14 Claims**



1. Apparatus for indicating the absence of a drain plug in a boat drain when the boat is in a launch condition comprising:
an electrically activated alarm means;

a power source electrically connected to said alarm means; and

circuit means mounted on an exterior portion of the boat for controlling the electrical connection between said alarm means and said power source, said circuit means having a normally open switching means for closing in response to immersion thereof into water, said normally open switching means electrically series connected with a normally closed switching means; and

an operating means for sensing the presence of the drain plug in the drain and for opening said normally closed switching means in response to said sensing by the operating means.

5,182,557

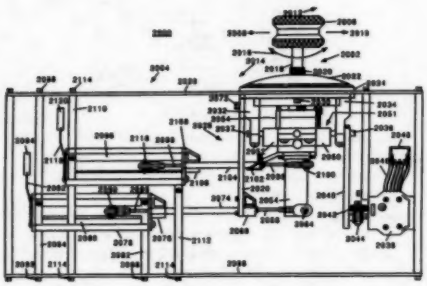
MOTORIZED JOYSTICK

Victor H. Lang, Ft. Collins, Colo., assignor to Semborg Recrob, Corp., Lansing, Ill.

Continuation-in-part of Ser. No. 410,114, Sep. 20, 1989, Pat. No. 5,021,878. This application Nov. 13, 1990, Ser. No. 613,381

Int. Cl.[5] G05B *19/42*; G05G *9/047*; B25J *9/18*

U.S. Cl. 341—20 **7 Claims**



1. A motorized joystick, comprising:

a housing;

a control handle;

a support supporting said handle in said housing for universal movement;

a first motor; and

a first connector connecting said control handle to said first motor; said first connector connects rotation of said control handle to said first motor; and further comprising a second motor, a second connector connecting said control handle to said second motor, to connect front and back movement of said control handle to said second motor; and a third motor, a third connector connecting said control handle to said third motor to connect right and left movement of said control handle to said third motor, wherein each of said motors is arranged for controlling movement of the control handle and at least one of said motors includes a linear output for driving the control handle.

5,182,558

SYSTEM FOR GENERATING CORRECTION SIGNALS FOR USE IN FORMING LOW DISTORTION ANALOG SIGNALS

Frank Mayo, Houston, Tex., assignor to Halliburton Geophysical Services, Inc., Houston, Tex.

Filed Oct. 25, 1991, Ser. No. 782,111

Int. Cl.[5] H03M *1/06*

U.S. Cl. 341—118 **34 Claims**

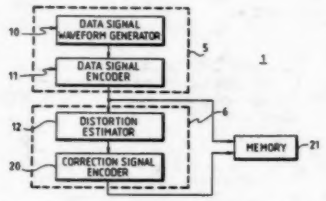
24. A method of generating a correction signal from a data signal for forming a low distortion analog signal, comprising the steps of:

generating a digital representation of a periodic waveform;

computationally encoding said digital representation of a periodic waveform into a data signal digital bitstream segment corresponding to one period of said periodic waveform, having known frequency, amplitude and phase characteristics, and having, when repetitively decoded, a signal distortion having frequency, amplitude, and phase characteristics;

storing said data signal digital bitstream segment in a memory;

computationally determining frequency, phase and amplitude characteristics within a frequency band of interest which said signal distortion of said data signal digital bitstream segment will have when said data signal digital



bitstream segment is repetitively decoded into an analog signal;

computationally encoding said determined frequency, phase and amplitude characteristics into a correction signal digital bitstream segment corresponding to approximately the same period of said periodic waveform as said data signal digital bitstream segment, and having increased amplitude by a scale factor greater than one and opposite phase from said determined frequency, phase and amplitude characteristics; and

storing said correction signal digital bitstream segment in said memory.

5,182,559

DIGITAL-ANALOG CONVERTER WITH PLURAL COEFFICIENT TRANSVERSAL FILTER

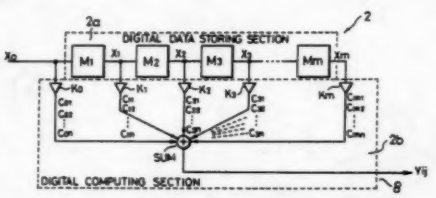
Takashi Tokuyama, Iwaki, Japan, assignor to Alpine Electronics, Inc., Tokyo, Japan

Continuation of Ser. No. 557,433, Jul. 23, 1990. This application Nov. 15, 1991, Ser. No. 795,245

Claims priority, application Japan, Jul. 28, 1989, 1-195724

Int. Cl.[5] H03M *1/66*; G06F *15/353*

U.S. Cl. 341—144 **10 Claims**



1. A digital-to-analog converter comprising:

a partial signal time series data generating section for delaying a unit pulse response signal into m time-delayed partial signals during a predetermined time interval T, and for digitally and repeatedly generating from each of the m time-delayed partial signals an item of time series numerical value, generating a total of m items of numerical values during every sampling period T/n, wherein n is >=3, and thereby generating a total of m*n items of numerical values every time interval T;

a digital data storing section for storing, while shifting, m digital values of the latest m time-delayed partial signals generated during the predetermined time interval T;

a digital computing section for multiplying each of the m time series numerical values of each time-delayed partial signal by the digital values stored in said storing section corresponding to each of the m time-delayed partial signals, and for adding the multiplication results, thereby producing one digital sum for every T/n sampling period; and

a converter for converting said digital sums from the digital computing section into an analog signal.

5,182,560

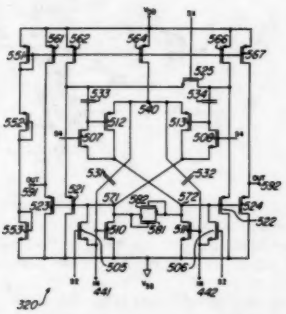
ANALOG-TO-DIGITAL CONVERTER FOR HIGH SPEED LOW POWER APPLICATIONS

Noboru Shiwaku, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 22, 1989, Ser. No. 455,126

Int. Cl.[5] H03K *5/24, 3/297*

U.S. Cl. 341—158 **9 Claims**



1. An analog-to-digital converter comprising:

(a) an analog input;

(b) at least one reference input;

(c) at least one comparator coupled to said analog input and said reference input, said comparator including a feedback sense amplifier with common mode feed through at each sense amplifier input, said common mode feed through provided by a capacitance coupling each said input to the drains of a differential pair transistor amplifier; and

(d) an output coupled to said comparator.

5,182,561

INTEGRATED CONVERTER WITH GATE FOR SUPPLYING INTEGRATING DOCK PULSES TO COUNTERS ONLY DURING REFERENCE SIGNAL INTEGRATING PERIOD

Tadao Sasaki, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed May 22, 1991, Ser. No. 704,049

Claims priority, application Japan, May 31, 1990, 2-142523

Int. Cl.[5] H03M *1/50*

U.S. Cl. 341—166 **7 Claims**

1. An integrated converter comprising:

input means for receiving an input signal;

an integrated A/D converter means for converting said input signal to an output signal outputted from an output means of said A/D converter means in response to an integrating clock signal, an output clock signal, and an integration start signal, each of which is derived from a system clock signal, said converter means including:

integrating means for integrating said input signal from said input means to provide an integrated input signal,

a plurality of comparators, having their outputs connected to a clock signal selector for comparing said integrated input signal to a first source of reference signals,

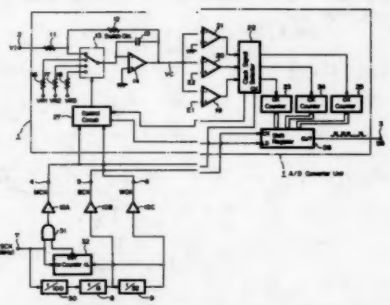
a second source of reference signals respectively supplied to said integrating means and controlled by said clock signal selector,

a plurality of counters in circuit with said clock signal selector,

and an output shift register connected to said counters and in circuit with said output means;

wherein said integrating means integrates said reference signals under the control of said clock signal selector and in synchronism with said integration start signal;

said plurality of counters counts pulses of said integrating clock until the integrated value of said integrating means reaches a value corresponding to said input signal, thereby to convert said input signal into said output signal based on the count of said plurality of counters; and



said integrated converter further comprising a gate for gating said integrating clock pulses to supply the integrating clock pulses to said plurality of counters only during a predetermined period in synchronism with said integration start signal, so that said integrating clock pulses are supplied to said plurality of counters only during an integrating period for said second source of reference signals.

5,182,562

FORWARD LOOKING RADAR

Franz Witte, Pürgen, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt für Luft- und Raumfahrt, Kön, Fed. Rep. of Germany

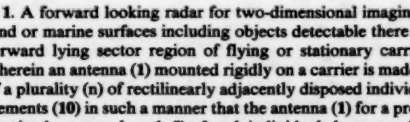
Filed Mar. 7, 1991, Ser. No. 665,827

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1990, 4007612

The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.

Int. Cl.[5] G01S *13/90*

U.S. Cl. 342—25 **3 Claims**



1. A forward looking radar for two-dimensional imaging of land or marine surfaces including objects detectable there in a forward lying sector region of flying or stationary carriers. wherein an antenna (1) mounted rigidly on a carrier is made up of a plurality (n) of rectilinearly adjacently disposed individual elements (10) in such a manner that the antenna (1) for a predetermined aperture length (l) of each individual element and for a predetermined distance (Δx with Δx=l/2) has an antenna length (L) of L=n.l/2, whereby by means of the respective individual elements (10) a transmitting and subsequent receiv-

ing takes place consecutively and coherently from the first to the last of the plurality (n) of individual elements (10), for implementing a digital coupling of the individual elements each individual element (10) is separately evaluated digitally and a digital processing is carried out by correlation of a specific predetermined reference function (R(x)) for each angular region.

5,182,563

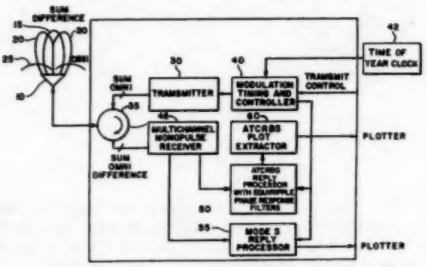
ENHANCED PERFORMANCE MODE S INTERROGATOR

Herman J. Blinchikoff, Pikesville, and Ann C. Schofield, Columbia, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1991, Ser. No. 786,835

Int. Cl.[5] G01S *13/91*

U.S. Cl. 342—32 **1 Claim**



1. An enhanced performance Mode S interrogator for interrogating an aircraft and processing a reply, said interrogator comprising:

a multi-pattern antenna;

a multichannel monopulse transmitter, operatively coupled to said multi-pattern antenna for transmitting interrogation information;

a monopulse receiver, operatively coupled to said multipatterned antenna for detecting pulses representing the reply, said receiver including an equiripple-phase response filter with finite peaks of attenuation that satisfies the following low pass prototype transfer functions

n odd

$$H(s) = \frac{(s^2 + \omega_1{}^2)(s^2 + \omega_2{}^2) \ldots (s^2 + \omega_{\frac{n-1}{2}})}{(s^n + a_{n-1}s^{n-1} + \ldots + a_0)}$$

n even

$$H(s) = \frac{(s^2 + \omega_1{}^2)(s^2 + \omega_2{}^2) \ldots (s^2 + \omega_{\frac{n-2}{2}})}{(s^n + a_{n-1}s^{n-1} + \ldots + a_0)}$$

reply processing means for determining the location of and identification of the aircraft based on the detected pulses.

5,182,564

GUIDANCE APPARATUS WITH DUAL MODE SENSOR

Fred T. Burkett; Jerome G. Bronson, both of Seattle, and Robert G. Heeren, Tacoma, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 26, 1984, Ser. No. 634,548

Int. Cl.[5] G01S *13/00*

U.S. Cl. 342—53 **19 Claims**

1. Apparatus for producing guidance signals relative to a target in conjunction with associated transmitter and receiver apparatus comprising:

a) a window transparent to both electro-optical and radio frequency radiation;

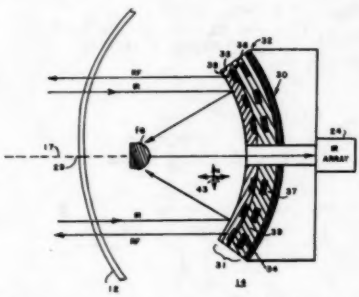
b) an electro-optical radiation detector positioned behind said window and producing a first guidance signal upon detection of electro-optical radiation from the target;

c) a dual reflector-antenna assembly positioned behind said window comprising:

i) a chemical vapor deposited substrate of dielectric material,

ii) a plurality of radio frequency antenna elements supported by said substrate and arranged to define an antenna beam axis, and

iii) reflective means reflective to electro-optical radiation



for concentrating electro-optical radiation transmitted through said window upon said electro-optical radiation detector, and for defining an electro-optical detection beam axis coincident with said antenna beam axis; and

d) transmission means coupled to said radio frequency antenna elements for supplying radio frequency energy generated by associated transmitter apparatus to said radio frequency antenna elements to form a beam of radio frequency radiation and for supplying a second guidance signal to associated receiver apparatus, said second guidance signal corresponding to radio frequency radiation reflected from a target through said window along said antenna beam axis.

5,182,565

IN-FURNACE SLAG LEVEL MEASURING METHOD AND APPARATUS THEREFOR

Akio Nagamune; Kouichi Tezuka; Isamu Komine; Shinji Kuriyama; Masaki Komatani, and Akihiko Inoue, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Mar. 27, 1991, Ser. No. 675,759

Claims priority, application Japan, Mar. 30, 1990, 2-81312; Mar. 30, 1990, 2-81313; Mar. 30, 1990, 2-81314

Int. Cl.[5] G01S *13/08*

U.S. Cl. 342—124 **9 Claims**

1. An in-furnace slag level measuring apparatus comprising:

a first rotator attached to a beam;

a first supporting member connected to said first rotator so as to be rotated about said beam by said first rotator;

a waveguide;

a first lift connected to a top of said first supporting member for controlling up/down movement of said waveguide;

a convertor with a lance hole;

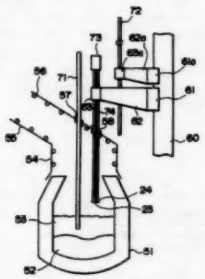
an antenna connected to said waveguide to be inserted into said convertor during the first and middle stages of refining period through said lance hole on said convertor hood by being driven by said first rotator and said first lift;

a microwave radar connected to said antenna through said waveguide for transmitting microwave modulated by pseudo random signal through said antenna during the first and middle stages of refining period for receiving a

reflection wave from the slag surface to measure a turnaround time of propagation and calculate the slag level from it;

a second rotator attached to said beam;

a second supporting member connected to said second rotator so as to be rotated about said beam by said second rotator;



a second lift connected to a top of said second supporting member for controlling up/down movement of a sublance; and

said sublance to be inserted into the convertor through said hold during the last stage of refining period by being driven by said second rotator and said second lift for performing various measurements.

5,182,566

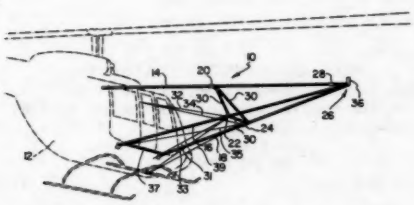
METHOD AND APPARATUS FOR UTILIZING A MOVABLE GPS ANTENNA FOR SURVEYING PURPOSES

James Ferguson, Old Chelsea, and Luc Pelletier, Quebec, both of Canada, assignors to GEOsurv, Inc. and Photocompilation PMS, Inc., Ontario, Canada

Filed Oct. 2, 1991, Ser. No. 769,727

Int. Cl.[5] G01S *5/02;* H01Q *1/28, 1/12*

U.S. Cl. 342—357 **26 Claims**



1. Apparatus for mounting on a rotary wing aircraft for supporting a Global Positioning Systems (GPS) receiving antenna, said apparatus comprising:

a boom structure for being fixed to and extending laterally to a side of said aircraft;

mounting means on said boom for cooperating with corresponding mounting means on said antenna for removably mounting said antenna on said boom; and

cable receiving means extending between said aircraft and said antenna and associated with said boom structure for receiving a communications cable attached to said antenna, wherein said cable receiving means permits the extension or retraction of said communications cable for allowing said antenna to be removed from said boom while maintaining operative communication of said antenna with said aircraft.

5,182,567

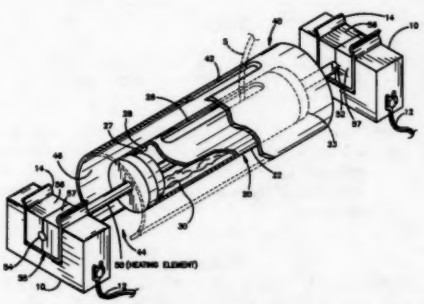
RETROFITTABLE VAPOR SOURCE FOR VACUUM METALLIZING UTILIZING SPATTER REDUCTION MEANS

Harold J. Wilder, Bay Village, Ohio, assignor to Custom Metallizing Services, Inc., Bay Village, Ohio

Filed Oct. 12, 1990, Ser. No. 714,581

Int. Cl.[5] C23C *14/00;* B01B *7/00*

U.S. Cl. 392—389 **14 Claims**



1. An evaporation source for use in a source continuous vacuum metal vaporizing process, for providing a metal vapor therefor, said evaporation source comprising:

a substantially closed container in the shape of a cylinder having an axis, having a refractory cylindrical wall with an inner and an outer surface thereof, and having a first and a second refractory end closure, said container being disposed with said axis thereof substantially in a horizontal orientation and said container adapted by means of having at least one through passage in said wall to allow the passage of a directed beam of said metal vapor;

said container being adapted to allow the feeding of a substantially continuous metal wire into said container by way of a said at least one through passage, thereby to supply to said container metal that may, when heated sufficiently, melt to form a pool of liquid metal therein and ultimately to vaporize and exit said container by way of a said at least one through passage;

means to heat said container and said metal to temperatures suitable for converting said metal to a liquid and then to a vapor;

said means to heat said container being adapted to be held in mechanical and electrical contact in the "arm chair" connections of the prior art, thereby making said evaporation source retrofittable into prior art vapor plating equipment; and

wherein said wall reduces particulate spatter and extraneous vapor condensation during operation of said evaporation source.

5,182,568

LOSS CANCELLATION ELEMENT FOR AN INTEGRAL ANTENNA RECEIVER

Douglass K. Stamps, Jr., Boynton Beach; Lorenzo A. Ponce de Leon, Lake Worth, and Jeffrey S. King, Boynton Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 21, 1990, Ser. No. 525,580

Int. Cl.[5] H01Q *1/24*

U.S. Cl. 343—702 **13 Claims**

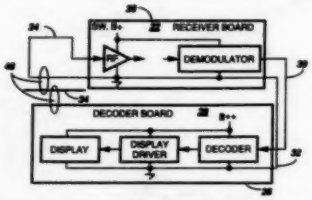
1. An antenna system for a communication receiver comprising a first circuit portion being located on a firs circuit substrate, and a second circuit portion being located on a second circuit substrate, said antenna system comprising:

antenna means, coupled to the first circuit portion and being located on the first circuit substrate;

at least one circuit element of said second circuit portion

being positioned in proximity to said antenna means to effect an interaction therewith; and

loss cancellation means, comprising a conductive sheet metal element and an insulating material enclosing said



conductive sheet metal element, said loss cancellation means being affixed with an adhesive to said second circuit substrate and interposed between said antenna means and said circuit element, for cancelling the interaction therebetween.

5,182,569

ANTENNA HAVING A CIRCULARLY SYMMETRICAL REFLECTOR

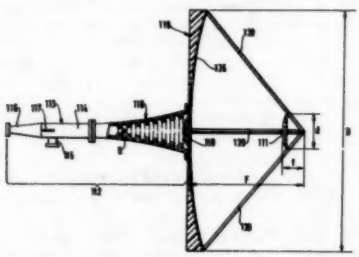
Nhu Bui-Hai, Le Vesinet, France, assignor to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 410,972, Sep. 22, 1989, abandoned. This application Feb. 14, 1991, Ser. No. 656,123

Claims priority, application France, Sep. 23, 1988, 88 12458; Sep. 23, 1988, 88 12459; Oct. 20, 1988, 88 13781

Int. Cl.[5] H01Q *19/19, 15/16, 1/12*

U.S. Cl. 343—781 CA **7 Claims**



1. An antenna comprising:

a centrifugally cast main reflector having a circularly symmetrical substantially concave paraboloidal metallic face, with a diameter of at least about 3.6 m;

a subreflector having a circularly symmetrical convex shaped face machined from a solid metal to a surface tolerance of no more than about ±0.1 mm and facing the concave face of the main reflector, said subreflector having a diameter no greater than about 0.6 m, said main reflector and said subreflector forming a Cassegrain optical system wherein the two reflectors have the same ratio of focal length to diameter of about 0.45;

a subreflector support in the form of four arms in a cross-configuration, each of said arms being fixed at one end to the periphery of the main reflector and having a cross section in the form of an isosceles triangle whose apex points in the direction of the main reflector;

an exponential profile corrugate horn aligned with the subreflector and the main reflector for receiving or transmitting microwaves, said corrugated horn defining a phase center and having an aperture end and a free end;

a lens made of a dielectric material and disposed at the aperture end of the corrugated horn with a focus of the lens coinciding with the phase center of the corrugated horn; and

a polarization duplexer disposed at the free end of the corrugated horn such that two fields are concentrated at 45° relative to the four arms of the subreflector support.

5,182,570

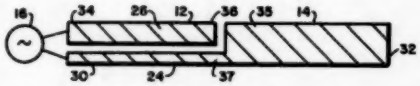
END FED FLAT ANTENNA

Paul A. Nysen, Randwick, Australia, and Jon L. Nagel, Cupertino, Calif., assignors to X-Cyte Inc., Mountain View, Calif.

Continuation of Ser. No. 434,233, Nov. 13, 1989, abandoned. This application Dec. 4, 1991, Ser. No. 803,712

Int. Cl.[5] H01Q *9/160, 9/280, 19/240, 1/270*

U.S. Cl. 343—795 **7 Claims**



1. An end fed dipole antenna for radiating electromagnetic waves of wavelength λ, said antenna comprising in combination:

(a) a first element having an effective radiating length substantially equal to λ/4, said first element having a first end and an opposite second end;

(b) a second element having an effective radiating length substantially equal to λ/4, said second element having a third end and an opposite fourth end, said first end, second end, third end and fourth end, respectively, being arranged on a common, substantially straight line with said second and third ends being adjacent to each other;

(c) a third element having an effective transmission length substantially equal to λ/4, said third element having a fifth end and an opposite sixth end and being arranged adjacent to said first element with said fifth end adjacent to said first end of said first element and said sixth end both adjacent to and physically connected with said third end of said second element; and

(d) energy providing means coupled to said first end of said first element and said fifth end of said third element for providing electrical energy to, and/or receiving electrical energy from said antenna.

5,182,571

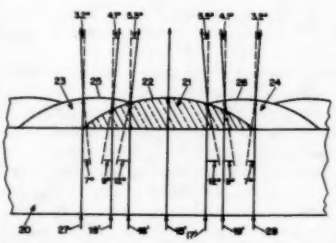
HOT MELT INK JET TRANSPARENCY

Linda T. Creagh, West Lebanon, N.H., and Charles W. Spehrley, Jr., Hartford, Vt., assignors to Spectra, Inc., Hanover, N.H.

Continuation of Ser. No. 485,289, Feb. 26, 1990. This application Sep. 3, 1991, Ser. No. 758,391

Int. Cl.[5] G01D *9/00, 15/18*

U.S. Cl. 346—1.1 **23 Claims**



1. A transparency comprising a transparent substrate, a colored ink pattern on the substrate containing three-dimensional spots of colored ink having curved surfaces and having an index of refraction, and a pattern of spots of colorless ink on

the substrate having centers which are laterally displaced with respect to the centers of the colored ink spots on the substrate and having approximately the same index of refraction as that of the colored ink spots in which there is no substantial diffusion of a colored ink into colorless ink.

5,182,572

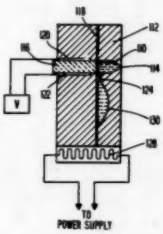
DEMAND INK JET UTILIZING A PHASE CHANGE INK AND METHOD OF OPERATING

Alfred R. Merritt; Theodore M. Cooke, both of Danbury; An-Chung R. Lin, New Town, and Richard G. Whitfield, Brookfield, all of Conn., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 93,151, Sep. 2, 1987, abandoned, which is a continuation of Ser. No. 938,334, Dec. 4, 1986, abandoned, which is a continuation of Ser. No. 610,627, May 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 507,918, Jun. 27, 1983, Pat. No. 4,484,948, which is a continuation of Ser. No. 331,604, Dec. 17, 1981, Pat. No. 4,390,369. This application Apr. 15, 1991, Ser. No. 685,979

Int. Cl.[5] B41J *2/04*

U.S. Cl. 346—1.1 **19 Claims**



1. A method of operating an impulse system for jetting a meltable ink which undergoes a thermally reversible liquid to solid phase transition, said method comprising the following steps:

elevating the temperature of said ink so as to effect a solid to liquid transition; and

ejecting a drop of liquid ink on demand toward a target wherein the drop strikes the target while in the liquid phase and undergoes a liquid to solid phase transition after striking the target and the drop travels no more than 0.6 cm to the target.

5,182,573

MULTI-COLOR-THERMAL PRINTER WITH A MOVABLE PRINTER HEAD

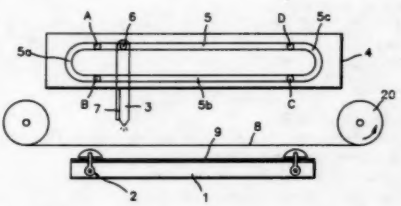
Jong-Woo Kim, Kyounggi-do, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Sep. 14, 1990, Ser. No. 582,417

Claims priority, application Rep. of Korea, Nov. 30, 1989, 17665-1989

Int. Cl.[5] B41J *2/325*; B41M *5/34*; G01D *9/00*

U.S. Cl. 346—1.1 **17 Claims**



1. A video printer, comprising:

a plate-like platen;

a pair of paper holders, each provided on respective ends of said platen;

a cam having a curved cam path;

a cam follower mounted in said curved cam path;

a bracket having one end attached to said cam follower; and

a thermal printing head attached to another end of said bracket, said thermal printing head being moved up or down and left and right by said cam follower moving along said curved cam path and above said platen.

16. A process for multi-color thermal printing, comprising:

loading an imprintable medium onto a planar first surface of a platen;

holding the imprintable medium fixedly in place with a pivotally operated pressing plate;

pressing a multi-color print ribbon against the imprintable medium with a thermal printing head;

moving said thermal printing head in a direction parallel to the first surface of the platen and along the print ribbon; and

raising the thermal printing head off of the print ribbon.

5,182,574

THERMAL HEAD

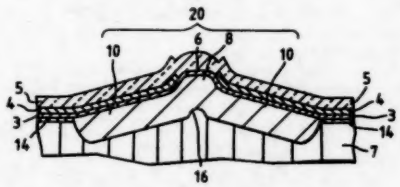
Masakazu Kato, Morioka; Takatoshi Ishikawa, Fukuoka, and Tetsuo Ishikawa, Tamayama, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1991, Ser. No. 739,960

Claims priority, application Japan, Aug. 9, 1990, 2-212308; Aug. 9, 1990, 2-212309

Int. Cl.[5] B41J *2/335*

U.S. Cl. 346—76 PH **9 Claims**



1. A thermal head comprising:

a silicon substrate having a projection defining a peripheral portion and a centrally-located crest;

a porous silicon oxide layer formed on said projection;

a heat-generating resistor layer formed on said porous silicon oxide layer;

a conductor layer formed on said heat-generating resistor layer, said conductor layer defining an opening disposed adjacent said crest; and

a protective layer formed to cover said heat-generating.

5,182,575

IMAGE FORMING APPARATUS

Motoi Kato, Yokohama, and Yoshitake Nagashima, Chigasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1990, Ser. No. 598,186

Claims priority, application Japan, Oct. 17, 1989, 1-268226

Int. Cl.[5] G01D *9/42*

U.S. Cl. 346—108 **23 Claims**

1. An image forming apparatus in which a light beam is adapted as an exposure source, comprising:

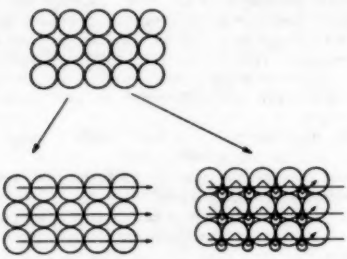
light-emitting means for emitting the light beam;

photoreceptive means on which a latent image is formed in correspondence with a beam spot formed by irradiating the photoreceptive means with the light beam;

scanning means for scanning the light beam, which is emit-

ted by said light-emitting means, so as to scan said photoreceptive means;

beam deflecting means for deflecting the beam spot a minute distance in a sub-scanning direction while the light beam is being deflected in a main scanning direction; and



control means for controlling said beam deflecting means in a manner such that a deflected beam spot is formed between two beam spots neighboring each other in the main scanning direction in a given main scanning line, the deflected beam spot being at a position shifted in the sub-scanning direction from the main scanning line where the two neighboring beam spots are located.

5,182,576

RASTER SCANNING APPARATUS

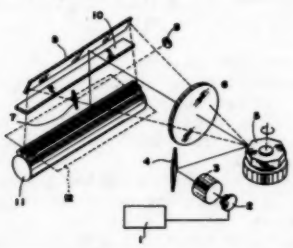
Katsumi Miwa, Osaka, Japan, assignor to Minolta Camera Co., Ltd., Osaka, Japan

Filed Apr. 5, 1990, Ser. No. 504,874

Claims priority, application Japan, Apr. 7, 1989, 1-89275

Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—108 **8 Claims**



1. A raster scanning apparatus for scanning a photosensitive material by a modulated laser beam, comprising:

output means for outputting the modulated laser beam in accordance with image signals;

raster scanning means including laser scanning means for scanning of the photosensitive material in a main scanning direction, and advancing means for advancing the photosensitive material in a secondary scanning direction;

designating means for designating the type of the photosensitive material; and

control means for controlling the output means and the raster scanning means to change picture element density of images to be formed on the photosensitive material in accordance with the designated type of the photosensitive material, thereby forming substantially the same exposure results irrespective of the type of the photosensitive material.

5,182,577

INK JET RECORDING HEAD HAVING AN IMPROVED SUBSTANCE ARRANGEMENT DEVICE

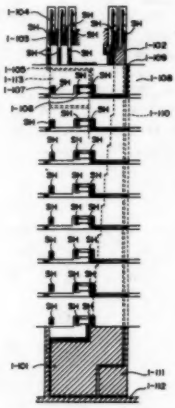
Hiroyuki Ishinaga, Tokyo; Asao Saito, Yokohama, and Toshihiro Mori, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1991, Ser. No. 645,732

Claims priority, application Japan, Jan. 25, 1990, 2-13489; Jan. 25, 1990, 2-13490

Int. Cl.[5] B41J *2/05*

U.S. Cl. 346—140 R **16 Claims**



1. A recording head comprising:

a plurality of liquid discharge portions each having a discharge opening for discharging ink; and

a substrate provided for generating thermal energy to electrothermal transducers for generating thermal energy to be utilized for discharging the ink supplied to said liquid discharging portions and a plurality of functional devices connected electrically to said electrothermal transducers,

wherein said plurality of functional devices are arranged in a direction different from an arrangement direction of said plurality of electrothermal transducers within a region provided with a wiring portion including common electrode wiring and selective electrode wiring for said plurality of electrothermal transducers and said plurality of functional devices, said plurality of electrothermal transducers are connected in the vicinity thereof to said common electrode wiring, and most of said wiring portion is formed at a lower layer lower than a layer where said electrothermal transducers are formed.

5,182,578

HEATING MECHANISM FOR WARMING THE INK IN THE WRITE HEAD OF AN INK PRINTER MEANS

Ernst Goepel, Germering, and Rudolf Schierjott, Munich, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Fed. Rep. of Germany

PCT No. PCT/DE88/00392, § 371 Date Dec. 28, 1990, § 102(e) Date Dec. 28, 1990, PCT Pub. No. WO90/00115, PCT Pub. Date Jan. 11, 1990

PCT Filed Jun. 29, 1988, Ser. No. 634,224

Int. Cl.[5] B41J *2/05*

U.S. Cl. 346—140 R **3 Claims**

1. A write head of an ink printer including a device for warming ink, the write head comprising:

a plurality of ink channels ending in discharge openings in the write head,

individually drivable, electrothermal transducer elements as first heating elements allocated to every ink channel under

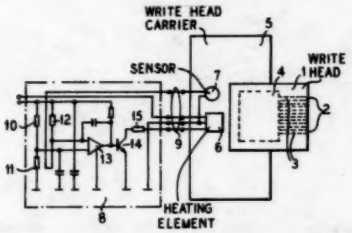
whose influence the ink in a region of a transducer element in the ink channel is suddenly heated until an ink vapor bubble is formed,

a write head carrier on which the write head is arranged that is large in area in comparison to the write head,

a temperature sensor element mounted on the write head carrier,

a regulating circuit means for producing a substantially constant load current to the write head,

an additional heating element being a component part of a voltage regulator connected directly across supply leads



of the regulating circuit, the additional heating element being an integrated circuit mounted in thermally conductive fashion on the write head carrier together with the temperature sensor element, said integrated circuit being operable at an active phase to regulate voltage across the supply leads and to simultaneously dissipate heat; and

means for connecting the additional heating element to receive the constant load current from the regulating circuit means until an operating temperature is reached as a result of dissipated heat of the additional heating element warming the write head carrier and the ink in the write head to the operating temperature.

5,182,579

INK-JET HAVING INK STORING ABSORBANT MATERIAL

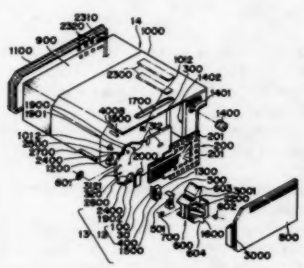
Masahiro Haruta; Masami Ikeda, both of Tokyo; Seiichiro Karita, Yokohama; Nobuyuki Kuwabara, Tokyo; Takahisa Kawamura, Yokohama; Masahiko Higuma, Togane; Teruo Arashima, Kawasaki; Tsutomu Abe, Isehara; Osamu Nishiwaki, Atsugi; Shinichi Tochihara, Hadano; Akira Nagashima, Tokyo; Makoto Aoki, Yokohama, and Kumiko Mafune, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1991, Ser. No. 727,910

Claims priority, application Japan, Jul. 10, 1990, 2-180431; Jul. 10, 1990, 2-180435; Jul. 10, 1990, 2-180436; Mar. 27, 1991, 3-63205; May 31, 1991, 3-155920; Jun. 29, 1991, 3-159225

Int. Cl.[5] B41J *2/175, 2/05*

U.S. Cl. 346—140 R **88 Claims**



1. An ink tank having an ink storing portion encasing an ink-absorbent member for holding ink, the ink-absorbent member comprising a porous material having therein compressed open cells, the compression ratio r_1 of an apparent volume V_1 before compression to an apparent volume V_2 after compression ($r_1 = V_1/V_2$) and the cell number p represented by number of cells per inch in the state of V_1 satisfying the relation (I) below, and p being not more than 60:

$$100 \text{ inch } [\text{inch}^{-1}] \leq r_1 \cdot p \leq 200 \text{ [inch}^{-1}] \quad \text{(I)}$$

5,182,580

INK JET RECORDING APPARATUS WITH ABNORMAL STATE DETECTION

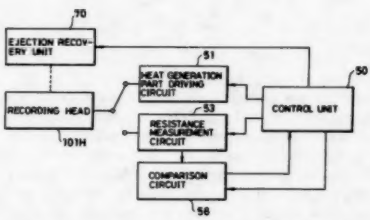
Kazue Ikeda, Yokohama, and Toshihiko Ujita, Yamato, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1991, Ser. No. 660,869

Claims priority, application Japan, Feb. 26, 1990, 2-42531; Feb. 26, 1990, 2-42532; Feb. 25, 1991, 3-30114

Int. Cl.[5] B41J *2/01, 2/165*

U.S. Cl. 346—140 R **7 Claims**



1. An ink jet recording apparatus for recording information by ejecting ink droplets onto a recording medium, said apparatus comprising:

a recording head having a plurality of ejection outlets for ejecting ink droplets, a plurality of ink liquid passages, each ink liquid passages having a normal or abnormal state and corresponding to a respective one of said plurality of ejection outlets, and a plurality of electro-thermal converting elements for generating thermal energy for ejecting the ink droplets, each of said plurality of electro-thermal converting elements being located in a respective one of said plurality of ink liquid passages, and said plurality of electro-thermal converting elements being used in such a manner as to be divided into a predetermined number of blocks when said plurality of electro-converting elements are driven and a state of said plurality of electro-converting elements are detected;

driving means for driving said plurality of electro-thermal converting elements by individual blocks of the predetermined number of blocks to generate the thermal energy;

detecting means for, on the basis of each individual block of the predetermined number of blocks, detecting respective signals in accordance with designated state changes occurring in said plurality of electro-thermal converting elements of one block or designated state changes in said plurality of ink liquid passages corresponding to said plurality of electro-thermal converting elements in the one block when said driving means drives said plurality of electro-thermal converting elements of the one block; and

judging means for judging a presence of an abnormal state in each of said plurality of ink liquid passages of the one block according to the signal detected by said detecting means.

5,182,581

INK JET RECORDING UNIT HAVING AN INK TANK SECTION CONTAINING POROUS MATERIAL AND A RECORDING HEAD SECTION

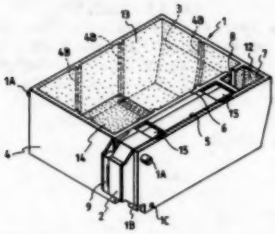
Makoto Kashimura, Tokyo; Hiroshi Nakagomi, Yamato; Seiichiro Karita; Tsuguhiro Fukuda, both of Yokohama; Tetsuo Kimura, Sagamihara; Hirofumi Hirano, Yokohama, and Mitsuru Kurata, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 641,331, Jan. 15, 1991, abandoned, which is a continuation of Ser. No. 385,152, Jul. 26, 1989, abandoned. This application Aug. 19, 1991, Ser. No. 747,487

Claims priority, application Japan, Jul. 26, 1988, 63-184690; Jul. 26, 1988, 63-184693; Jul. 26, 1988, 63-184695; Jul. 26, 1988, 63-184697; Jul. 26, 1988, 63-184698; Apr. 25, 1989, 1-105488

Int. Cl.[5] B41J *2/175*

U.S. Cl. 346—140 R 44 Claims



1. An ink tank for storing ink, comprising:

an ink storage section including an ink containing member for containing ink, said ink containing member being provided over substantially the entire range of an ink storage area of said ink storage section; and

a ventilation section having a vent hole communicating the interior of said ink tank with atmospheric air, and an ink-repellent member for repelling said ink, wherein said containing member in said ink tank comprises first and second ink containing members, said second ink containing member for carrying ink and having a high porosity and said first ink containing member having a lower porosity than that of said second ink containing member, said ink-repellent member, said second ink containing member and said first ink containing member being accommodated in the mentioned order from the side of said vent hole communicating the inner space of said ink tank with atmospheric air to the side of an ink supply passage for supplying ink to a recording head.

5,182,582

INK JET RECORDING APPARATUS WITH CLEANING MEANS THAT CLEANS LIGHTER-INK DISCHARGE PORTIONS BEFORE DARKER-INK DISCHARGE PORTIONS

Shigeru Okamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 442,456, Nov. 30, 1989, abandoned, which is a continuation of Ser. No. 113,998, Oct. 29, 1987, abandoned. This application Jan. 24, 1992, Ser. No. 825,420

Claims priority, application Japan, Oct. 31, 1986, 61-260026; Oct. 27, 1987, 62-270842

Int. Cl.[5] B41J *2/165*

U.S. Cl. 346—140 R 10 Claims

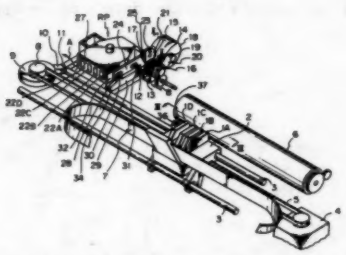
1. An ink jet recording apparatus comprising:

recording means having a first recording head having a first ink discharge opening for discharging a first ink and a second recording head having a second ink discharge opening for discharging a second ink lighter than the first ink side by side, a given ink being lighter than another ink if the color of a mixture of those two inks is closer to the color of the other ink than to the color of the given ink;

cleaning means for cleaning said recording heads one after the other;

setting means for setting said cleaning means in a cleaning or a non-cleaning position;

a reciprocable carriage for moving said first and second recording heads across said cleaning means when said cleaning means is in the cleaning position to clean said recording heads in a predetermined order so that the



recording head for a lighter ink is never cleaned after ea recording head for the darker ink; and

a releasing member at the downstream side of said carriage for releasing said cleaning means and placing said cleaning means into the non-cleaning position, wherein said cleaning means is cleaned by second cleaning means disposed on the downstream side of said carriage and thereafter said first-mentioned cleaning means is placed into the non-cleaning position.

5,182,583

INK-JET HAVING BATTERY CAPACITY DETECTION

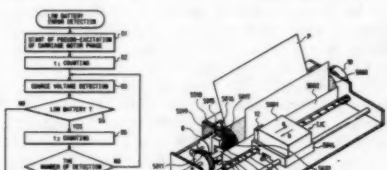
Hideo Horigome, Tokyo, and Junichi Arakawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1991, Ser. No. 730,096

Claims priority, application Japan, Jul. 17, 1990, 2-189245; Jul. 17, 1990, 2-189247

Int. Cl.[5] B41J *2/165, 2/05*

U.S. Cl. 346—140 R 50 Claims



1. An ink jet recording apparatus to which power is supplied from a battery and which records onto a recording medium by using a recording head which discharges ink from a discharge port, comprising:

battery detecting means for detecting run-down in battery capacity of the battery on the basis of a voltage of the battery;

capping means for capping the discharge port of the recording head;

load control means for applying a load to the battery for a predetermined period of time just before the capping means cancels the capping of the discharge port of the recording head; and

detection control means for allowing the battery detecting

means to execute the voltage detection for said predetermined period of time.

5,182,584

MULTICOLOR DEVELOPING DEVICE WITH IMPROVED MOVABLE FRAME ARRANGEMENT

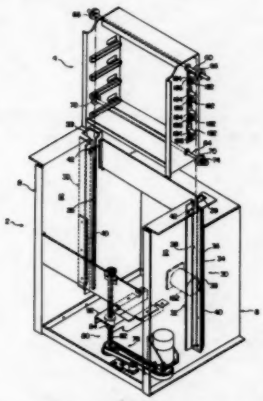
Yasuyuki Fukunaga, Hirakata; Hideki Kita, Suita; Akira Nakakuma, Takaishi; Toru Taniguchi, Hirakata; Hidehiro Fukui, Shisou, and Yoshinobu Takemura, Kita Katsuragi, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Nov. 26, 1990, Ser. No. 617,770

Claims priority, application Japan, Nov. 29, 1989, 1-311245; May 22, 1990, 2-130395

Int. Cl.[5] G01D *15/06*

U.S. Cl. 346—157 38 Claims



1. A multicolor developing device comprising:

a stationary frame member,

a movable frame member mounted on said stationary frame member to reciprocally move in a predetermined direction,

a plurality of developing mechanisms mounted on said movable frame member and maintaining a distance in said predetermined direction, and

a moving means for reciprocally moving said movable frame member in said predetermined direction,

each of said plurality of developing mechanisms being selectively positioned at a developing zone by movement of said movable frame member caused by said moving means and each of said plurality of developing mechanisms executing developing action with a different color at said developing zone,

said moving means including a screw means that has a threaded shaft extending in said predetermined direction and a nut engaged with said threaded shaft, and a rotary drive source comprising a stepping motor that rotates said threaded shaft of said screw means,

one of said stationary frame member and said movable frame member having disposed thereon, a pair of rail means that extend in said predetermined direction and maintain a distance in the lateral direction,

each of said rail means having a pair of rail members that extend in said predetermined direction and that are disposed in opposition to each other to maintain a predetermined distance therebetween, and the other of said stationary frame member and said movable frame member having two pairs of rollers disposed thereon to maintain a distance in said predetermined direction, said roller pairs being rotatably disposed and maintaining a distance in said lateral direction,

said roller pairs having an outer diameter that meets said predetermined distance between said rail members of said rail means, and being placed between said rail members.

5,182,585

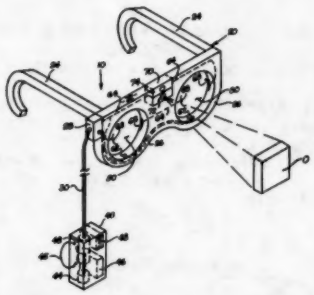
EYEGLASSES WITH CONTROLLABLE REFRACTING POWER

Robert B. Stoner, Tucson, Ariz., assignor to The Arizona Carbon Foil Company, Inc., Tucson, Ariz.

Filed Sep. 26, 1991, Ser. No. 765,886

Int. Cl.[5] G02C *1/00*

U.S. Cl. 351—41 16 Claims



1. Eyeglasses with controllable refractive power, comprising:

(a) spectacles consisting of a frame and a supporting structure for normal wear by a user;

(b) at least one liquid lens mounted on said frame and capable of variable refractive power as a function of the amount of liquid contained in it;

(c) means for measuring the distance between said spectacles and an object being viewed by the user; and

(d) means for adjusting the amount of liquid in said at least one liquid lens to cause it to correct the focus of the eye of the user to the measured distance;

wherein said at least one liquid lens consists of a circular spacer ring sandwiched between a transparent stretchable membrane facing forward and a transparent rigid disk facing the eye of the user, and of a transparent fluid contained therein.

5,182,586

SUNGLASSES STRUCTURE

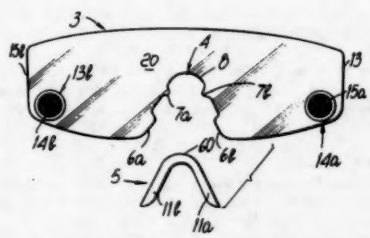
Antonio Bennato, Fener di Alano di Piave, Italy, assignor to Moda Solaris S.p.A., Pederobba, Italy

Filed Jul. 20, 1990, Ser. No. 556,246

Claims priority, application Italy, Jan. 26, 1990, 82511 A/90

Int. Cl.[5] G02C *9/00*

U.S. Cl. 351—47 13 Claims



1. Sunglasses structure comprising a front portion, two arms hinged to said front portion, an arcuately shaped lens connected to said front portion, a downwardly open V-shaped

milling formed centrally in said lens, said V-shaped milling comprising a perimetral edge a first pair of raised portions protruding inwardly from said perimetral edge, and a second pair of raised portions protruding inwardly from said perimetral edge, an elastically deformable V-shaped bridge being connected to said V-shaped milling, said bridge having a perimetral groove and wings, said perimetral groove accommodating said perimetral edge of said V-shaped milling and comprising a first pair of seats, said first pair of seats accommodating said second pair of raised portions, said wings having ends, said ends comprising a second pair of seats, said second pair of seats accommodating said first pair of raised portions.

5,182,587

EYEGLASS FRAME HAVING ANTIROTATION CONNECTION

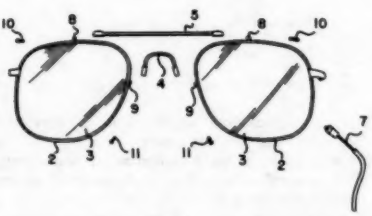
Isao Hyoi, Fukui, Japan, assignor to Murai Co., Ltd., Fukui, Japan

PCT No. PCT/JP88/01172, § 371 Date Jul. 17, 1990, § 102(e) Date Jul. 17, 1990, PCT Pub. No. WO90/05936, PCT Pub. Date May 31, 1990

PCT Filed Nov. 18, 1988, Ser. No. 543,841

Int. Cl.[5] B02C *5/02*

U.S. Cl. 351—124 **1 Claim**



1. An eyeglass frame for a pair of right and left eyeglass lenses, comprising

a pair of right and left rims for supporting the eyeglass lenses;

a bridge member for connecting said rims;

a bar member secured to upper potions of said rims for reinforcing a connection between said rims;

a temple member secured to a side portion of each of said rims;

an anti-rotation groove formed at an end of said bar member; and

an engagement tube having one end having an inner threaded portion which is engaged with said anti-rotation groove; said engagement tube having another end provided with a flat portion formed thereon, said flat portion including a hole formed therein and said engagement tube being secured to said rim by screw means passing through said hole.

5,182,588

LENS FOR FILTERING VISIBLE AND ULTRAVIOLET ELECTROMAGNETIC WAVES DURING DENTAL PROCEDURES

Robert D. Maurer, 2700 W. Dimond Blvd., Anchorage, Ak. 99502, and Timothy B. McLaughlin, c/o Anchorage Eye Association, 800 E. Dimond, Ste. 228A, Anchorage, Ak. 99515

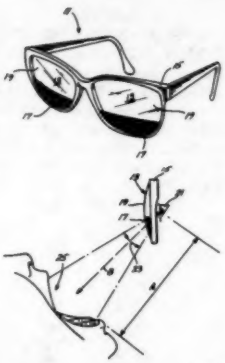
Filed Jul. 1, 1991, Ser. No. 724,149

Int. Cl.[5] G02C *7/10*; A61C *5/00*

U.S. Cl. 351—165 **9 Claims**

1. A lens for filtering visible and ultraviolet electromagnetic waves emitted by a source of electromagnetic waves used in a dental curing procedure, the lens comprising:

an ophthalmic lens, the ophthalmic lens including a first lens surface having a blocking portion that absorbs electromagnetic waves in the visible spectrum having a wavelength of about 530 nanometers or less and ultraviolet electromagnetic waves, and transmits electromagnetic waves in the visible spectrum having a wavelength of



about 530 nanometers or greater, the blocking portion occupying less than a lower one-third of the first lens surface.

5,182,589

CAMERA USING FILM WITH MAGNETIC RECORDING PORTION HAVING FILM FEEDING MOTOR POSITIONED TO MINIMIZE THE EFFECT OF NOISE THEREFROM

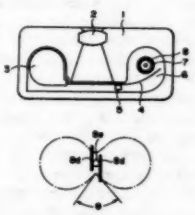
Hideo Tamamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1991, Ser. No. 701,867

Claims priority, application Japan, May 18, 1990, 2-128408

Int. Cl.[5] G03B *17/24*

U.S. Cl. 354—105 **6 Claims**



1. A camera using film with a magnetic recording portion, said camera comprising:

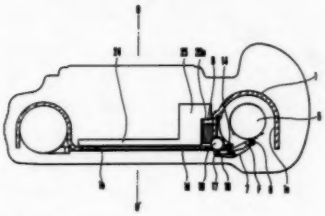
(A) a magnetic head for effecting a writing or reading of information onto or from the magnetic recording portion of the film during a feeding of the film; and

(B) a motor for feeding said film, said motor having a commutator and brushes contacting with said commutator, said motor being disposed so that a tangential direction of said brushes with respect to said commutator may be substantially parallel to a line linking an output shaft of said motor and said magnetic head.

5,182,590
CAMERA

Shoji Kaihara, and Shousuke Haraguchi, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1991, Ser. No. 650,865
Claims priority, application Japan, Feb. 9, 1990, 2-30021; Feb. 9, 1990, 2-30023
Int. Cl.[5] G03B *17/24, 1/60*
U.S. Cl. 354—106 **9 Claims**



1. A camera comprising:

a) a data imprinting device for imprinting data on a film surface from a front side of an optical axis, said data imprinting device being disposed between an aperture and a spool in a position to overlap with a focal plane shutter unit in the direction of said optical axis;

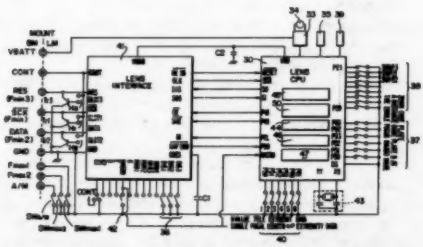
b) a rotary member arranged to be rotated following the movement of said film surface, said rotary member being disposed between said aperture and said spool; and

c) control means for controlling an action of said data imprinting device by detecting an amount of rotation of said rotary member.

5,182,591
CAMERA SYSTEM

Masahiro Kawasaki; Hiroyuki Takahashi, and Shigeru Iwamoto, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1991, Ser. No. 692,678
Claims priority, application Japan, Apr. 27, 1990, 2-113700
Int. Cl.[5] G03B *3/00*
U.S. Cl. 354—195.1 **19 Claims**



1. A camera system for communicating data between a micro computer associated with a camera body and a zoom lens that is selectively mounted to said camera body, wherein at least focal length data is transmitted from said zoom lens to said micro computer, said zoom lens comprising:

a position detecting means for detecting divided focal length steps corresponding to optional focal lengths of said zoom lens;

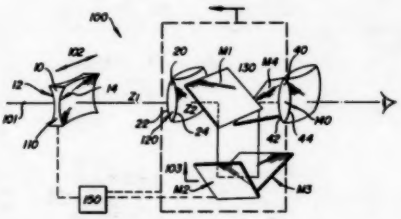
a specific focal length outputting means for outputting at least one focal length of a focal length step detected by said position detecting means; and,

an arithmetic operating means for calculating a focal length in each focal length step, in accordance with data representing a divided focal length step detected by said position detecting means and data representing a focal length from said specific focal length outputting means.

5,182,592
REAL IMAGE ZOOM VIEWFINDER

Ellis I. Betensky, W. Redding, Conn., and Paul L. Ruben, Penfield, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 13, 1991, Ser. No. 699,012
Int. Cl.[5] G03B *13/14, 13/10, 13/08*
U.S. Cl. 354—221 **15 Claims**

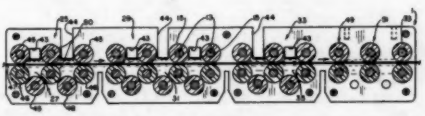


1. A real image zoom viewfinder system comprising three optical units each having optical power, the system having a minimum of three lens elements each having refractive optical power and one of which optical units is movable along an optical axis of the system and including an additional movable reflective optical unit, wherein zooming is performed by moving only a single optical unit having a refractive optical power and the single additional reflective optical unit.

5,182,593
ROLLER TANK

Warren Fischer, St. Charles, Ill., assignor to Fischer Industries, Inc., Geneva, Ill.

Filed Jan. 14, 1991, Ser. No. 641,459
Int. Cl.[5] G03D *3/08*
U.S. Cl. 354—322 **5 Claims**



1. An apparatus for conveying a work piece through a fluid bath, comprising:

a plurality of tank sections, each of said tank sections including a pair of spaced upper opposed side wall rollers, a pair of spaced lower opposed side wall rollers, respective individual ones of the pair of said upper and lower opposed side wall rollers abutting one another, a plurality of bottom rollers, at least two of said bottom rollers respectively abutting at least two of said side wall rollers, respectively and a pair of intermediate rollers, at least one of said intermediate roller pair abutting both of said at least two bottom rollers and the other intermediate roller;

means for supporting said rollers for rotational movement, said supporting means including a pair of opposed frame members, and a plurality of shafts, each of said shafts having a respective roller mounted thereon, a friction reducing element mounted on preselected ones of said shafts along each end thereof, and means for mounting the rollers of at least said lower opposed side wall rollers and said bottom rollers against said frame in fluid leak resistant relationship; and

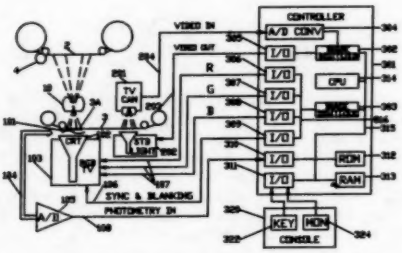
a plurality of containers positioned beneath each of said tank sections, at least one of said frame members having prepositioned openings formed in it to permit direct fluid communication between respective one of said tank sections and the container associated with said respective tank section.

5,182,594

CRT METHOD OF AND APPARATUS FOR ILLUMINATING PHOTOGRAPHIC NEGATIVES TO PRODUCE A HARD COPY

Talmadge W. Hopson, 12965 Rutledge Cir., Minnetonka, Minn. 55343

Filed Oct. 9, 1991, Ser. No. 773,438
Int. Cl.[5] G03B 27/80
U.S. Cl. 355—20 10 Claims



1. An apparatus for illuminating color photographic negatives in order to produce a positive color print, comprising:

(a) a rgb color television set;

(b) said rgb color television set having a high intensity cathode ray tube whose envelope has fused to it a lens in lieu of a faceplate;

(c) said high intensity cathode ray tube having a dispenser type cathode;

(d) said high intensity cathode ray tube having coated on the entrance pupil of said lens phosphors whose radiometric characteristics match the sensitometric character of a color print media;

(e) a general controller with image digitizing and video signal generating capability;

(f) a radiometric means of determining the chromic and intensity output of said high intensity cathode ray tube;

(g) a scanning densitometric means of determining the chromic and luminance characteristics of light transmitted through a color photographic negative;

(h) a scanning densitometric means of determining the chromic and luminance characteristics of light reflected from a surface;

(i) a memory means data is used to generate a controlled light pattern to expose a sample swatch of said color print media;

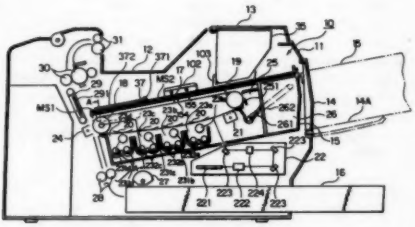
(j) said cathode ray tube having displayed on its screen a high intensity plain colored raster illuminating a subject negative for selected intervals in response to a video signal generated by said general controller based on an aggregate of subject negative transmission density and digital data stored in random access memory of said controller which was derived from sensitometric characteristics of said sample swatch of said color print media after being duly exposed to said controlled pattern of light and subsequently processed into a sample print so as to faithfully reproduce images captured on said subject negative economically and without human intervention.

5,182,595

IMAGE FORMING APPARATUS HAVING AN DISMOUNTABLE PROCESS CARTRIDGE

Masakazu Fukuchi; Shizuo Morita; Satoshi Haneda; Hisao Satoh, and Tadayoshi Ikeda, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 18, 1991, Ser. No. 732,580
Claims priority, application Japan, Jul. 26, 1990, 2-200786; Jul. 26, 1990, 2-200787; Jul. 26, 1990, 2-200788
The portion of the term of this patent subsequent to Jun. 30, 2009, has been disclaimed.
Int. Cl.[5] G03G 15/00
U.S. Cl. 355—200 9 Claims



1. An image forming apparatus for forming an image from corresponding image signals, comprising:

holding means for holding a latent image corresponding to said image signals;

developing means for developing said latent image on said holding means so that a developed image is formed on said holding means;

transfer means for transferring said developed image on to a recording sheet at a transfer region;

cleaning means for cleaning a residual toner remaining on said holding means after said developed image is transferred on to said recording sheet;

enclosing means removably mounted in said image forming apparatus by an operator, for enclosing at least one of said holding means, said developing means, and said cleaning means;

cover means for covering said apparatus, said cover means having a closed position and an open position;

first detecting means for detecting said open position of said cover means, and for generating an open cover signal; and

moving means connected to said first detection means and said enclosing means for automatically moving said enclosing means in a given direction between a first position, where said enclosing means is in said image forming apparatus whereby said image forming apparatus is operational, and a second position, where at least a portion of said enclosing means is outside said image forming apparatus to thereby facilitate removal of said enclosing means from said image forming apparatus by said operator; and

said moving means automatically moving said enclosing means to said second position when said moving means receives said open cover signal from said first detecting means indicating that the cover means is in the open position.

5,182,596

DEVICE FOR MEASURING SURFACE POTENTIALS AT PHOTOSENSITIVE BODY AND ELECTROSTATIC RECORDING APPARATUS USING SAID DEVICE

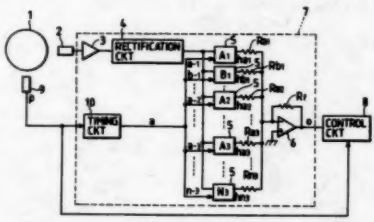
Takashi Nakazawa; Minoru Ohshima; Masami Ishikawa; Tsukasa Ogawa; Tohru Miyasaka, and Takao Umeda, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd. and Hitachi Ltd., both of Tokyo, Japan

Filed Jul. 10, 1991, Ser. No. 727,740

Claims priority, application Japan, Jul. 20, 1990, 2-190531

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—203 7 Claims



1. A device for measuring a surface potential on a photosensitive body, said device detecting a position on said photosensitive body using a position sensor and measuring said surface potential on said photosensitive body based on an output of said position sensor, said device comprising:

means for measuring said surface potential at a plurality of positions on said photosensitive body where said measuring means comprises a single surface potential measurement device;

a plurality of holding means for holding measured surface potentials; and

means for adding each of said measured surface potentials held in each of said holding means.

5,182,597

IMAGE FORMING DEVICE

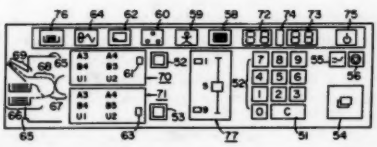
Shunichi Masuda, Tokyo; Katsuichi Shimizu, Hoya; Toshiaki Yagasaki, Hino, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 297,344, Jan. 17, 1989, Pat. No. 5,003,346, which is a continuation of Ser. No. 379,677, May 19, 1982, Pat. No. 4,811,051, which is a continuation of Ser. No. 83,643, Oct. 11, 1979, abandoned. This application Feb. 25, 1991, Ser. No. 660,741

Claims priority, application Japan, Oct. 15, 1978, 53-126720; Oct. 15, 1978, 53-126722; Oct. 15, 1978, 53-126723; Oct. 15, 1978, 53-126726; Oct. 15, 1978, 53-126727; Oct. 15, 1978, 53-126728; Nov. 2, 1978, 53-135201; Dec. 11, 1978, 53-153372; Dec. 11, 1978, 53-153373; Dec. 11, 1978, 53-153375

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—205 4 Claims



1. An image forming apparatus, comprising:

conveying means for conveying a recording material along a predetermined path that includes a first position and a second position downstream from the first position;

jam detecting means for detecting a recording material jam at the first position and for detecting a recording material jam at the second position;

first indicating means, responsive to said jam detecting means detecting a recording material jam at the first position, for displaying an indication of the first position in a figure indicative of a general appearance of said image forming apparatus; and

second indicating means, responsive to said jam detecting means detecting a recording material jam at the second position, for displaying an indication of the second position in a figure indicative of a general appearance of said image forming apparatus;

wherein the figure indicative of the general appearance of said image forming apparatus is not visible when a jam is not detected by said jam detecting means.

5,182,598

CONTROL MEANS FOR A TRANSFER CHARGER IN AN IMAGE FORMING APPARATUS

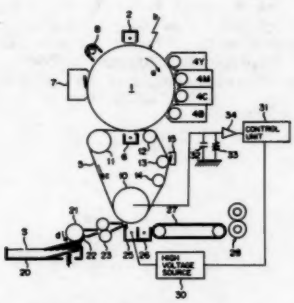
Yoshinobu Hara, Shinshiro; Shizuo Yuge, Toyokawa, and Kazuyoshi Hara, Isehara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 19, 1991, Ser. No. 762,404

Claims priority, application Japan, Sep. 20, 1990, 2-252349; Sep. 20, 1990, 2-252350

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—208 17 Claims



1. An image forming apparatus comprising:

a toner image carrying member;

means for providing the toner image carrying member with a toner image;

a transfer charger facing the toner image carrying member;

means for feeding a sheet between the toner image carrying member and the transfer charger;

means for supplying electric power to the transfer charger;

means for measuring electric charge applied to the sheet by the transfer charger; and

means for controlling the power supplying means so as to apply a specified amount of charge to the sheet, based on the measurement result by the measuring means.

5,182,599

MULTI-COLOR IMAGE FORMING APPARATUS AND METHOD OF SETTING IMAGE DATA FOR SAME

Naoyoshi Kinoshita, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 7, 1991, Ser. No. 741,739

Claims priority, application Japan, Aug. 8, 1990, 2-210737

Int. Cl.[5] G03G *15/00, 15/01*

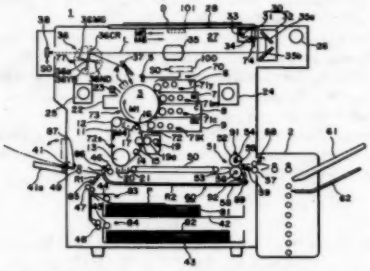
U.S. Cl. 355—208 25 Claims

1. A method of setting image data for a plurality of developers, comprising the steps of:

forming a first toner image on the image support member with a first developer in response to first image data;

detecting the first toner image so as to output a detection signal;

changing the first image data in accordance with the detection signal; and



changing second image data for a second developer in accordance with a predetermined relationship each time the first image data is changed in accordance with the detection signal.

5,182,600

TONER END DETECTING METHOD FOR AN ELECTROPHOTOGRAPHIC COPIER

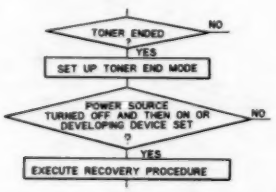
Shin Hasegawa, Kawasaki; Hajime Oyama, Ichikawa; Eiichi Katoh, Tokyo, and Masao Moriya, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 29, 1991, Ser. No. 799,941

Claims priority, application Japan, Nov. 30, 1990, 2-337643

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—246 **8 Claims**



1. In a toner end detecting method for an electrophotographic copier, comprising the steps of:

electrostatically forming a latent image of a reference pattern on a photoconductive element;

developing said latent image by a developing section of a developing device for producing a toner image;

determining the density of said toner image and the density of the background of said photoconductive element by a density sensor;

controlling the supply of a toner from a toner supply section of said developing device to said developing section on the basis of a ratio of the outputs of said density sensor representative of the density of said background and the density of said toner image, respectively; and

inhibiting a copying operation on determining that said toner supply section has reached a toner end condition;

the method further including executing a recovery procedure in which a toner end mode is set up when said toner supply section has reached a first toner end condition based upon said ratio, and wherein after said toner end mode is set up, said toner end mode is cancelled if said toner supply section has not reached a second toner end condition based upon said ratio and a power source of said copier is turned off and then on, said toner end mode also cancelled after set up if said toner supply section has not reached a second toner end condition based upon said ratio and said developing device has recently been set on said copier.

5,182,601

IMAGE FORMING APPARATUS HAVING TONER HANDLING UNITS WHICH ARE ALTERNATIVELY USABLE AS A DEVELOPING DEVICE OR A CLEANING DEVICE

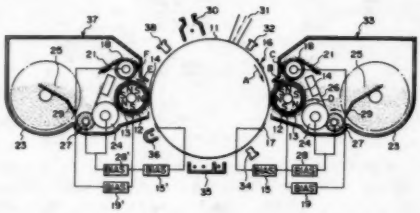
Takashi Hodoshima, Kawasaki, and Shunji Katoh, Sagamihara, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 20, 1991, Ser. No. 658,383

Claims priority, application Japan, Feb. 20, 1990, 2-37461; Jun. 13, 1990, 2-154238; Jan. 16, 1991, 3-3293

Int. Cl.[5] G03G *15/09, 21/00*

U.S. Cl. 355—270 **3 Claims**



1. In an image forming apparatus having an area for electrostatically forming a latent image on an image carrier, an area for developing said latent image to produce a toner image, an area for transferring said toner image to a recording medium, and an area for cleaning said image carrier to remove a residual toner remaining on said image carrier after the transfer of said toner image, a first toner handling unit comprising:

a magnet brush roller;

a toner storing section storing a toner therein;

toner collecting means for collecting said toner in said toner storing section;

toner supplying means for supplying said toner from said toner storing section to said magnet brush roller;

toner sensing means for sensing the toner stored in said toner storing section; and

means for inhibiting said first toner handling unit from being located in said area for forming a toner image in response to an output of said toner sensing means which indicates that the toner does not exist in said toner storing means;

wherein said toner handling unit is constructed so as to be selectively set in either of said area for forming a toner image and said area for cleaning said image carrier;

wherein said toner handling unit functions as a developing device when said unit is set in said area for forming a toner image; and

wherein said toner handling unit functions as a cleaning device when said unit is set in said area for cleaning said image carrier.

5,182,602

IMAGE FORMING APPARATUS

Akihiko Kakita; Tsugio Sugizaki, and Yozo Fujii, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 1, 1991, Ser. No. 649,055

Claims priority, application Japan, Feb. 5, 1990, 2-25824; Feb. 5, 1990, 2-25825

Int. Cl.[5] G03G *15/14*

U.S. Cl. 355—271 **6 Claims**

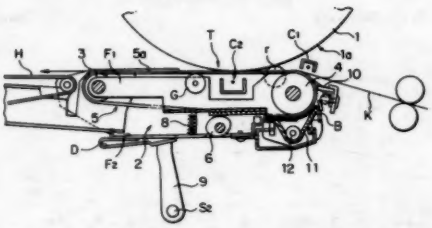
1. An apparatus for forming an image, comprising:

means for carrying a toner image on an imaging surface thereof; and

a transfer belt assembly having a predetermined weight including:

a plurality of rollers; and

a belt rotatable around said plurality of rollers so as to convey a recording sheet thereon, said transfer belt assembly adapted to be pivotable around a pivot axis thereof between a first position on which said belt is brought in contact with said imaging surface and a second position in which said belt is spaced away from said imaging surface, wherein said second position is vertically spaced from said first position;



a cam pivotably contacting a first distinct supporting point of said transfer belt assembly for lifting up said transfer belt assembly to said first position and for lowering said transfer belt assembly to said second position; and

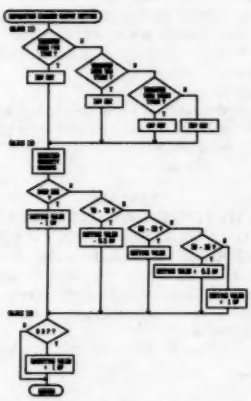
a spring disposed independently of said cam and contacting a second distinct supporting point of said transfer belt assembly to support at least a part of said predetermined weight of said transfer belt assembly, thereby reducing the weight contacting said cam member.

5,182,603

SEPARATION CHARGER CONTROL FOR ELECTRO-PHOTOGRAPHIC APPARATUS

Takanobu Yamada, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 10, 1991, Ser. No. 697,984
Claims priority, application Japan, May 15, 1990, 2-125826
Int. Cl.[5] G03G *15/14*
U.S. Cl. 355—273 **9 Claims**



1. An image forming apparatus, comprising:

a photoconductor;

means for forming a toner image on the photoconductor;

an intermediate transfer member disposed opposite to the photoconductor for holding a sheet on its cicumferential surface;

a transfer charger disposed opposite to the photoconductor through the intermediate transfer member for transferring a toner image from the photoconductor onto a sheet held on the intermediate transfer member;

a separation charger disposed at a downstream side of the transfer charger in the rotational direction of the intermediate transfer member for separating the sheet from the intermediate transfer member;

means for recognizing the number of times the toner image is transferred; and

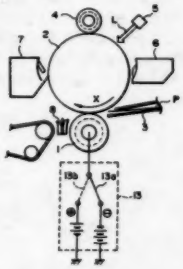
means for setting an output of the separation charger corresponding to the number of times the toner image is transferred.

5,182,604

TRANSFER ROLLER WITH VOLTAGE POLARITY CONTROL

Jun Asai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1991, Ser. No. 670,172
Claims priority, application Japan, Mar. 17, 1990, 2-65563
Int. Cl.[5] G03G *15/16*
U.S. Cl. 355—273 **48 Claims**



20. An image forming apparatus, comprising:

an image bearing member movable along an endless path;

image forming means for forming a toner image on said image bearing member, said image forming means including charging means for charging said image bearing member;

a member contactable to said image bearing member, said contactable member being supplied with a voltage having the same polarity as the toner during a developing operation to transfer the toner from said contactable member to said image bearing member; and

means for causing a region of said image bearing member to have a potential of a polarity which is the same as the charging polarity of said charging means before said region reaches a position at which said region contacts said contactable member so that said region does not have a polarity opposite from the charging polarity of said charging means after said region passes through said position.

5,182,605

XEROGRAPHIC PRINTING MACHINE WITH AN IMPROVED TRANSFER UNIT

Masato Yamada; Junji Shirakawa, and Kazuo Uno, all of Ibaraki, Japan, assignors to Hitachi Koki Co. Ltd., Tokyo, Japan

Filed Nov. 29, 1991, Ser. No. 800,090
Claims priority, application Japan, Nov. 30, 1990, 2-337659
Int. Cl.[5] G03G *15/16*
U.S. Cl. 355—274 **4 Claims**

1. A xerographic printing machine, comprising:

at least two rollers disposed so as to have their axes of rotation arranged parallel to each other;

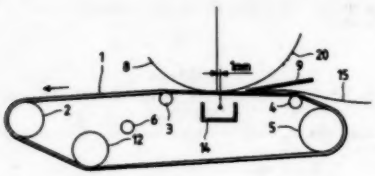
an endless belt, supported by said rollers;

a photoreceptor disposed adjacent to said endless belt;

means for electrically charging said endless belt disposed

opposite said photoreceptor so that said endless belt is located between said charging means and said photoreceptor, whereby an electrostatically charged toner supported on a surface of said photoreceptor is transferred to a print media by virtue of an electric field generated by said charging means;

a guide member disposed between said photoreceptor and



one of said rollers located upstream of said photoreceptor, as viewed in the advancing direction of said endless belt, and positioned in an area along said belt that is subject to said electric field so as to bring said print media into contact with said endless belt, said guide member creating a gap between said print media and said photoreceptor, in said area, so as to cause a discharge to occur between said photoreceptor and said charging means in said area.

5,182,606

IMAGE FIXING APPARATUS

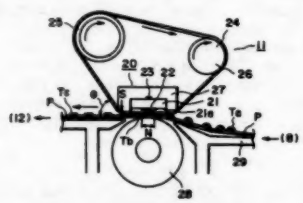
Akira Yamamoto, Tokyo; Shigeo Kimura, Yokohama; Kensaku Kusaka, Kawasaki; Hidekazu Maruta, Hachiohji, and Hiroyuki Adachi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 542,068, Jun. 22, 1990, abandoned. This application Oct. 5, 1991, Ser. No. 782,790

Claims priority, application Japan, Jun. 22, 1989, 1-161388

Int. Cl.[5] G03G *15/20*

U.S. Cl. 355—289 **12 Claims**



1. An image fixing apparatus, comprising:

a heater having at least generating resistor for generating heat upon electric power supply and a protection layer for protecting said heat generating resistor; and

a resin film movable with one surface in contact with said protection layer and the other surface in contact with a recording material having a visualized image, said film comprising a heat resistive resin base layer contactable to said protection layer and a parting layer thereon contactable to said recording material;

wherein said base and parting layer comprise filler materials, and the filler material in said base layer has a higher resistivity than the filler material in said parting layer.

5,182,607

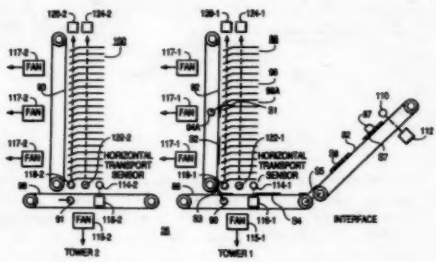
HIGH-VOLUME DUPLICATOR SYSTEM AND METHOD PROVIDING EFFICIENT TOWER AND DUPLICATOR OPERATION AND FACILITATED UNLOADING IN THE COLLATED DUPLEX MODE

Charles D. Braswell, 72 Churchhill Rd., Henrietta, N.Y. 14467; Robert E. Carley, 81 Foxbourne Rd., Penfield, N.Y. 14526, and Riley L. Warddrip, 37 Muirfield Crt., Pittsford, N.Y. 14534

Filed Aug. 13, 1991, Ser. No. 744,162

Int. Cl.[5] G93G *21/00*

U.S. Cl. 355—323 **11 Claims**



1. A copy system comprising:

means for duplicating successive original documents;

said duplicating means having a limited capacity duplex tray for supporting copy processing in the duplex mode;

means for sorting output copies delivered from said duplicating means;

said sorting means having a plurality of towers each of which has a plurality of bins;

means for transporting output copies to each of said towers;

means for directing output copies in each tower to each bin therein;

means for controlling said duplicating means and said transporting said directing means for said towers and said bins in the collated duplex mode;

said controlling means including means for allocating a number of bins for the accumulation of each collated set;

said controlling means further including means for operating said towers in a single tower loading mode if the number of bins for each collated set is equal to or less than a predetermined number; and

said controlling means additionally including means for operating said towers in a multiple tower loading mode if the number of bins for each collated set is greater than the predetermined number.

5,182,608

METHOD AND APPARATUS FOR APPLYING TONER TO AN ELECTROSTATIC IMAGE

Arthur S. Kroll; Arthur E. Dunn, both Rochester; Michael L. DeCecca, Fairport; David M. Gaudino, Rochester; Jerry E. Livadas, Webster; David R. McDougal, Fairport, and James G. Rydelek, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1990, Ser. No. 621,681

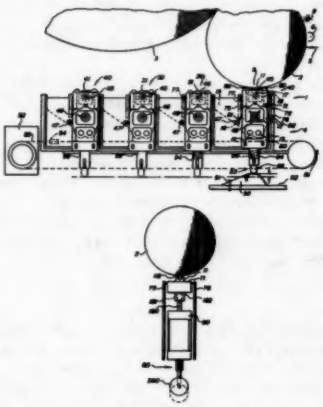
Int. Cl.[5] G03G *15/01*

U.S. Cl. 355—326 **37 Claims**

1. A developing device for applying toner to an electrostatic image carried on an image member as said electrostatic image moves through a developing position, said developing device comprising a plurality of developing units, each unit including an applicator which applicator includes rotatable means for moving dry particulate developer through the developing position and a housing which housing includes means for supplying such dry particulate developer to said applicator,

characterized in that each of said units is movable to a posi-

tion aligned with said developing position, and each of said applicators is movable toward and away from said



developing position with respect to said means for supplying.

5,182,609
SPECTROMETER

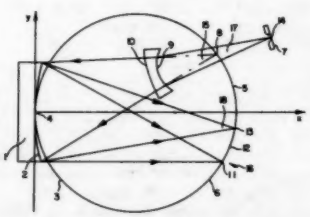
Stefan Florek; Reiner Güther, and Helmut Becker-Ross, all of Berlin, Fed. Rep. of Germany, assignors to Zentralinstitut für Optik und Spektroskopie, Berlin-Adlershof, Fed. Rep. of Germany

Filed Apr. 24, 1991, Ser. No. 690,729

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 340209

Int. Cl.[5] G01J *3/28*

U.S. Cl. 356—328 **4 Claims**



1. A spectrometer having an entry slit, an imaging diffraction grating, a planar receiver system, and an element for flattening the image field, wherein the improvement comprises that a body of low refractive power and having a secondary spectrum is used as the element for flattening the image field, said body having at least two optically active surfaces, and is disposed between the entry slit and the diffraction grating.

5,182,610
POSITION DETECTING METHOD AND DEVICE THEREFOR AS WELL AS ALIGNING DEVICE

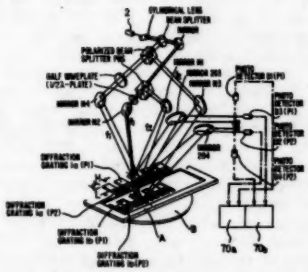
Hiromasa Shibata, Tokyo, Japan, assignor to Sortec Corporation, Tokyo, Japan

Filed Apr. 19, 1991, Ser. No. 688,115

Claims priority, application Japan, Apr. 19, 1990, 2-101571; Jul. 3, 1990, 2-174585; Jul. 6, 1990, 2-177236; Oct. 11, 1990, 2-270580

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—349 **22 Claims**



1. A position detecting method wherein diffraction gratings having not less than two kinds of diffraction pitches are arranged on both 1st and 2nd substances with parallel plane surfaces; coherent lights having two components with slightly different frequencies and with crossed planes of polarization are injected to said diffraction gratings along a line included in a plane (A) which includes, and hence is defined by, a line normal to said plane surface of said 1st substance, a line normal to said plane surface of said 2nd substance, and a line parallel to the grooves of said diffraction gratings, that is, "vertically", so as to be diffracted along ±n-th order directions which subtend, in a plane (B) orthogonal to the plane (A), angles (e.g. θ of FIG. **5** or $\theta 1$ and $\theta 2$ of FIG. **21**) satisfying diffraction formula with respect to lines normal to the surfaces of said substances, or said coherent lights are injected along specific ±n-th order directions to the diffraction gratings so as to be diffracted "vertically"; the detection of the diffracted lights are conducted in such a manner that, by causing two frequency components diffracted gratings with the same pitches arranged on each of said substances respectively to interfere; the beat signals are generated and the phase differences between beat signals derived from the different substances are measured, and finally in accordance with the thus obtained not less than two kinds of phase differences, the displacing amounts of the 1st and 2nd substances are detected.

5,182,611
DIGITAL SYNTHETIC SERRODYNE FOR FIBER OPTIC GYROSCOPE

Michael S. Bielas, Phoenix, and Tamim F. El-Wailly, Peoria, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 391,002, Aug. 9, 1989, abandoned. This application Mar. 29, 1991, Ser. No. 680,596

Int. Cl.[5] G01C *19/72*

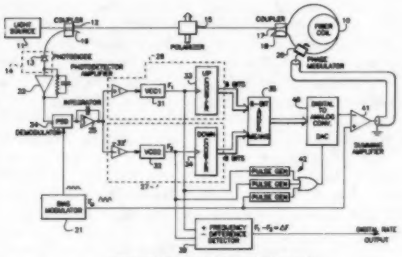
U.S. Cl. 356—350 **19 Claims**

1. A digital synthetic serrodyne phase difference controller for a rotation sensor capable of sensing rotation about an axis of a coiled optical fiber based on having a pair of electromagnetic waves propagating through said optical fiber in opposite directions to both impinge on a photodetector with a phase difference relationship therebetween. said digital synthetic serrodyne phase difference controller comprising:

a phase detector means having an input electrically connected to said photodetector to receive an output signal therefrom representative of phase differences occurring in

pairs of electromagnetic waves impinging thereon, said phase detector means being capable of providing an output signal on an output thereof representative of both magnitude and direction of said phase differences indicated by said photodetector output signal;

a dual output generator means having an input electrically connected to said phase detector means output to receive said phase detector means output signal, said dual output generator means having first and second pluralities of outputs and being capable of providing a first plurality of digit output signals each at a corresponding one of said first plurality of outputs which signals together represent a succession of amplitude values and a second plurality of digit output signals each at a corresponding one of said second plurality of outputs which signals together represent a succession of amplitude values, said first plurality of digit output signals together having a basic set of successive amplitude values repeated at selected frequencies with said basic repetition set consisting of a relatively large fraction of said succession of amplitude values therein having substantially increasing magnitudes followed by a much smaller fraction thereof having substantially decreasing magnitudes, said second plurality of digit output signals together having a basic set of successive amplitude values repeated at selected frequencies with said basic repetition set consisting of a relatively large fraction of said succession of amplitude values having substantially decreasing magnitudes followed by a much smaller fraction thereof having substantially increasing magnitudes, said frequencies of repetition of said basic repetition sets in said first and second pluralities of output signals being determined by said phase detector means output signal;



SYNTHETIC DIGITAL SERRODYNE MODULATOR

a combination means having a plurality of inputs and a plurality of outputs and comprising a first digital adder means having a plurality of outputs on which corresponding ones of a plurality of digit output signals are provided thereby that can be a basis for a plurality of digit output signals provided at said combination means outputs, a first plurality of inputs serving as a portion of said combination means inputs each electrically connected to a corresponding one of said first plurality of outputs of said dual output generator means to receive said first plurality of digit output signals therefrom, and a second plurality of inputs serving as a portion of said combination means inputs each electrically connected to a corresponding one of said second plurality of outputs of said dual output generator means to receive said second plurality of digit output signals therefrom, said first digital adder means being capable of providing said plurality of digit output signals together representing a succession of amplitude values each having a magnitude representative of magnitudes of amplitude values in said dual output generator means first and second pluralities of digit output signals algebraically combined;

a digital-to-analog converter means having an output and a plurality of inputs each electrically connected to a corresponding one of said combination means plurality of outputs to receive said combination means plurality of digit output signals together representing a succession of amplitude values based at least in part on said first digital adder means plurality of digit output signals, said converter means providing an analog output signal at said output thereof representative of said succession of amplitude values in said combination plurality of digit output signals received; and

a frequency translation means electrically connected to said digital-to-analog converter means output, said frequency translation means being positioned in a corresponding optical path portion selected from among those optical path portions taken by electromagnetic waves to reach or leave said coiled optical fiber enroute on an optical path to said photodetector in said rotation sensor to be capable of providing a frequency translation of any such electromagnetic wave passing therethrough in propagating along said optical path.

5,182,612

METHOD OF MEASUREMENT OF AN ANGLE OF INCIDENCE OF A LUMINOUS BEAM, MEASURING DEVICE FOR CARRYING OUT THE METHOD AND USE OF THE DEVICE FOR THE MEASUREMENT OF DISTANCES

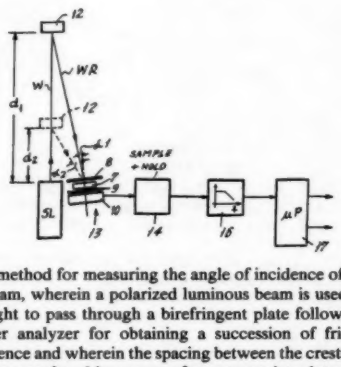
Charles Rhême, Le Coutset, CH - 1725 Posieux, Switzerland

Filed May 23, 1991, Ser. No. 704,449

Claims priority, application Switzerland, May 23, 1990, 01772/90

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—351 **23 Claims**



1. A method for measuring the angle of incidence of a luminous beam, wherein a polarized luminous beam is used which is brought to pass through a birefringent plate followed by a polarizer analyzer for obtaining a succession of fringes of interference and wherein the spacing between the crests of said fringes are analysed by means of an appropriate detector and an analyzing electronic circuit, said spacing being a direct function of the angle to be measured.

5,182,613

POSITION DETECTING APPARATUS GENERATING PERIODIC DETECTION SIGNALS HAVING EQUAL THIRD AND FIFTH HARMONIC COMPONENTS

Atsushi Ieki; Yasukazu Hayashi, and Keiji Matsui, all of Niwa, Japan, assignors to Okuma Corporation, Aichi, Japan

Filed Jul. 25, 1991, Ser. No. 735,908

Claims priority, application Japan, Jul. 30, 1990, 2-201715

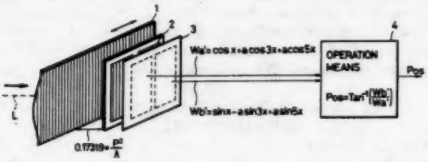
Int. Cl.[5] H01J *3/14;* **G01B** *11/14*

U.S. Cl. 356—374 **5 Claims**

1. A position detection apparatus comprising:

displacement detecting means for generating first and second periodic signals in accordance with a displacement of a relatively movable object, said first and second periodic signals differing in phase relative to each other and each including a third harmonic component and a fifth har-

monic component which are approximately equal to one another;



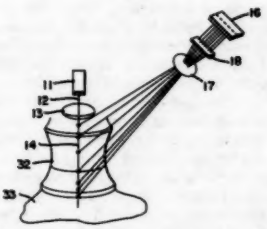
positional data generating means for processing said first and second periodic signals to obtain and output corresponding positional data denoting a relative position of relatively movable object.

5,182,614

TWO-DIMENSIONAL PROFILE DETECTION SYSTEM

Melvin H. Lill, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Jan. 31, 1991, Ser. No. 648,066
Int. Cl.[5] G01B *11/24*
U.S. Cl. 356—376 **6 Claims**



1. A system for detecting a two dimensional profile on a body within a field of view, comprising

a plurality of energy emission means for emitting a plurality of energy emission beams substantially within a plane containing the two dimensional profile,

projector lens means interposed between said plurality of energy emission means and the body for focusing the beams in a known fan-like pattern having known diverging projection directions within the field of view,

excitation means for individually exiting said plurality of energy emission means in predetermined sequence and for providing a plurality of excitation indicative signals corresponding thereto, said energy beams being reflected by the body upon impingement thereon,

a plurality of detector means for receiving said reflected energy beams for each defining discrete field depth sectors within the field of view and for individually receiving reflected energy beams within one of said field depth sectors and providing a plurality of discrete sector signals corresponding to ones of said received reflected energy beams,

detector lens means interposed between the body and said plurality of detector means for focusing reflected energy beams within the field of view on said plurality of detector means, and

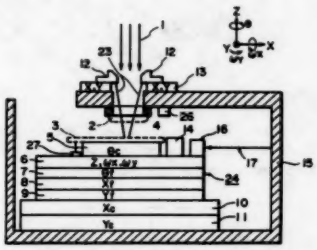
means for receiving said plurality of discrete sector signals and said plurality of excitation indicative signals and for indicating a locus of points having discrete sector and known projection direction characteristics along the body profile within the energy beam emission plane.

5,182,615

EXPOSURE APPARATUS

Hiroshi Kurosawa, Atsugi; Koji Uda, Yokohama; Kunitaka Ozawa, Isehara; Shunichi Uzawa, Tokyo; Nobutoshi Mizusawa, Yamato; Shigeyuki Suda, Yokohama; Noriyuki Nose, and Takao Kariya, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1990, Ser. No. 563,420
Claims priority, application Japan, Aug. 7, 1989, 1-202775; Aug. 31, 1989, 1-223293; Oct. 3, 1989, 1-257077
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—400 **12 Claims**



1. An exposure apparatus for printing a pattern of a mask on a wafer, said apparatus comprising:

a mask chuck for holding the mask;

a mask stage for moving said mask chuck;

a wafer chuck for holding the wafer;

a wafer stage for moving said wafer chuck along a stage coordinate system;

a photoelectric detector, movable integrally with said wafer chuck when said wafer chuck is moved by said wafer stage, for receiving a light beam and for producing an output;

a light emitting element, movable integrally with said mask chuck when said mask chuck is moved by said mask stage, for projecting a light beam toward said photoelectric detector; and

control means for processing an output of said photoelectric detector produced when said mask chuck is moved by said mask stage, to detect a change in position of the mask based on positional information related to the coordinate system of said wafer stage, and for controlling movement of said wafer stage for positioning the wafer by said wafer chuck on the basis of the obtained position information.

5,182,616

COLOR COMMUNICATION KITS

Kenneth G. Roberts, and Elaine E. Roberts, both of Warwick, R.I., assignors to K. G. Roberts & Associates, East Greenwich, R.I.

Filed Apr. 3, 1991, Ser. No. 680,130
Int. Cl.[5] G01I *3/46*; G09B *19/00*
U.S. Cl. 356—402 **31 Claims**

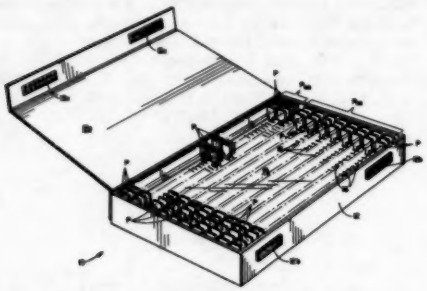
1. A color communication kit comprising:

a number of discrete rigid three-dimensional color plaques having a selected depth dimension, at least some of said plaques being chromatic color plaques constituting a chromatic series and others of of said plaques being achromatic color plaques constituting an achromatic series;

said chromatic color plaques in said chromatic series being formed of a transparent plastics material and respectively having a unique non-printed color homogeneously present throughout the depth dimension, wherein

said chromatic color plaques in said chromatic series are

arranged in order of respective color hue and chromatic value for each of the color plaques therein, and wherein



said achromatic color plaques in said achromatic series are arranged in order of respective achromatic value for each of the plaques therein.

5,182,617

SAMPLE SUPPLY DEVICE AND SAMPLE INSPECTION APPARATUS USING THE DEVICE

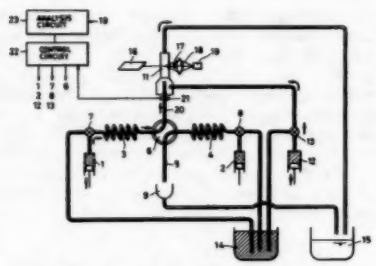
Yoshito Yoneyama, Kawasaki; Yoshiyuki Toge, and Naoki Yuguchi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1990, Ser. No. 545,589

Claims priority, application Japan, Jul. 20, 1989, 1-189728

Int. Cl.[5] G01N *21/05*

U.S. Cl. 356—440 **32 Claims**



1. A sample supply device comprising:

a sample receiving channel for receiving a plurality of samples from a source;

a sample supply channel for supplying the samples to a position to be supplied;

first and second sample storage means for storing respective samples;

first and second pressurizing means, in communication with said first and second sample storage means, respectively, for extruding and aspirating samples stored in said first and second storage means; and

channel switching means capable of switching between a first mode and a second mode, with the first mode being a state in which said first sample storage means is connected to said sample suppy channel and said second sample storage means is connected to said sample receiving channel, and the second mode being a state in which said first sample storage means is connected to said sample receiving channel and said second sample storage means is connected to said sample supply channel.

5,182,618

REFLECTOMETRIC METHOD OF MEASUREMENT AND APPARATUS FOR REALIZING THE METHOD

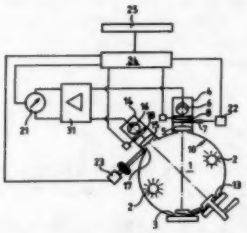
Aimo Heinonen, Örkkiniityntie 19, SF-02970 Espoo, Finland

Continuation of Ser. No. 512,020, Apr. 16, 1990, abandoned, which is a continuation of Ser. No. 296,348, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 934,949, Nov. 26, 1986, abandoned. This application Nov. 13, 1991, Ser. No. 793,261

Claims priority, application Finland, Nov. 27, 1985, 854700

Int. Cl.[5] G01N *21/47*; G01J *1/00*; G01T *1/00*

U.S. Cl. 356—446 **4 Claims**



1. A method of measuring the reflectometric properties of a sample by employing a 2-channel reflectometer having a measuring channel and a reference channel with each channel having a measuring diaphragm, comprising the steps of calibrating the reflectometer by placing a standard sample in the measuring channel, adjusting the light intensities in the measuring channel and the reference channel into balance through operation of the measuring diaphragm of the reference channel to provide a calibration measurement, placing a sample to be measured in the measuring channel, adjusting the light intensities in the measuring channel and the reference channel to balance by actuation of the measuring diaphragm in the reference channel, and calculating the reflective value of the sample to be measured by use of the set value of the measuring diaphragm of the reference channel from the reflectance value of the standard sample on the basis of the set value of the measuring diaphragm of the reference channel in the calibration measurement.

5,182,619

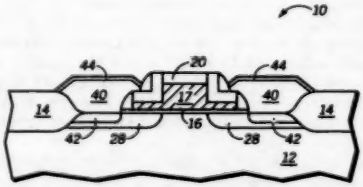
SEMICONDUCTOR DEVICE HAVING AN MOS TRANSISTOR WITH OVERLAPPED AND ELEVATED SOURCE AND DRAIN

James R. Pfiester, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 3, 1991, Ser. No. 753,500

Int. Cl.[5] H01L *29/78, 27/02, 23/48*

U.S. Cl. 257—382 **13 Claims**



1. A semiconductor device having a MOS transistor with an overlapped and elevated source and drain, comprising:

a silicon substrate;

an inverse-T gate electrode overlying the substrate and separated from the substrate by a gate dielectric, the inverse-T gate electrode having a body portion and first and second shelf portions;

first and second lightly doped regions of a first conductivity formed in the substrate on opposing sides of the inverse-T gate electrode;

an elevated, single crystalline silicon source electrode of the first conductivity formed on the first lightly doped region;

an elevated, single crystalline silicon drain electrode of the first conductivity formed on the second lightly doped region; and

a dielectric separating the elevated source electrode and elevated drain electrode from the inverse-T gate electrode;

wherein the source electrode and the drain electrode each have a facet along a predetermined, non-vertical, and non-horizontal crystallographic plane; and

wherein the facet of the source electrode overlies the first shelf portion and the facet of the drain electrode overlies the second shelf portion.

5,182,620

ACTIVE MATRIX DISPLAY DEVICE

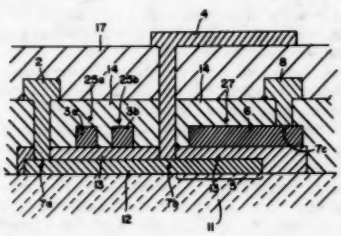
Takayuki Shimada, Nara; Yasuhiro Matsushima, Kashihara, and Yutaka Takafuji, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Apr. 2, 1991, Ser. No. 678,077

Claims priority, application Japan, Apr. 5, 1990, 2-90963

Int. Cl.[5] H01L *27/01*

U.S. Cl. 257—72 **7 Claims**



1. An active matrix display device comprising:

an insulated substrate;

a semiconductor layer covering the substrate;

a first insulating layer covering the semiconductor layer;

a gate electrode and a capacitor electrode formed on the first insulating layer;

a second insulating layer covering the first insulating layer and the gate electrode and capacitor electrode formed on the first insulating layer;

a signal line for carrying an image signal formed on the second insulating layer and extending through holes in the second insulating layer and the first insulating layer for connection to the semiconductor layer which covers the substrate;

a third insulating layer covering the second insulating layer and the signal line formed on the second insulating layer; and

a pixel electrode formed on the third insulating layer.

5,182,621

INPUT PROTECTION CIRCUIT FOR ANALOG/DIGITAL CONVERTING SEMICONDUCTOR

Kiyonobu Hinooka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 365,954, Jun. 14, 1989, abandoned. This application Mar. 27, 1991, Ser. No. 677,618

Claims priority, application Japan, Jun. 14, 1988, 63-147205

Int. Cl.[5] H01L *29/06, 29/78, 27/02*

U.S. Cl. 257—546 **1 Claim**

1. An input circuit having a plurality of input protection circuits for a corresponding number of input channels, the input circuit being formed on a semiconductor substrate having a p-type conductivity, each of the input protection circuits comprising:

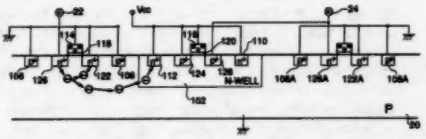
an analog input terminal (**24**) which is to be connected to receive an analog voltage signal;

a first wiring conductor for a first voltage (Vcc);

a second wiring conductor for a second voltage (GND) which is lower than said first voltage;

a p-channel MOS field effect transistor formed in an independent n-type region (**102**) formed in said semiconductor substrate and having a drain (**128**) connected to said input terminal (**24**) and a gate (**116**) and a source (**124**) connected in common to said first wiring conductor, said p-channel MOS field effect transistor operating to discharge a first excessive voltage to said first wiring conductor when said first excessive voltage is applied to said input terminal, said p-channel MOS field effect transistor also including a pair of channel stoppers (**110** and **112**) formed within said independent n-type region (**102**) and respectively located at the outside of said source and said drain, said pair of channel stoppers being connected to said first wiring conductor; and

an n-channel MOS field effect transistor formed in a p-type region in said semiconductor substrate, and having a drain (**126A**) connected to said input terminal (**24**) and a gate and a source (**122A**) connected to said second wiring conductor, said n-channel MOS field effect transistor operating to discharge a second excessive voltage to said second wiring conductor when said second excessive



voltage is applied to said input terminal, said n-channel MOS field effect transistor also including a pair of channel stoppers (**106A** and **108A**) formed within said p-type region in said semiconductor substrate and respectively located at the outside of said source and said drain, said pair of channel stoppers being connected to said second wiring conductor,

said p-channel MOS field effect transistor formed in said n-type region and said n-channel MOS field effect transistor formed in said p-type region of all the input protection circuits being alternately located in such a manner that only one p-channel MOS field effect transistor is located between a pair of n-channel MOS field effect transistors and only one n-channel MOS field effect transistor is located between a pair of p-channel MOS field effect transistors, whereby each adjacent MOS field effect transistors is an opposite conduction type with respect to the conduction type of its neighboring transistors, and

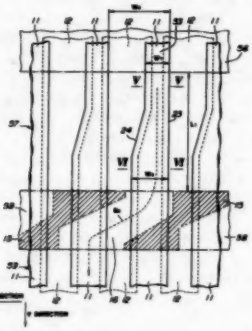
said drain (**128**) of said p-channel MOS field effect transistor in each input protection circuit being located farther than said source (**124**) of the same p-channel MOS field effect transistor from the drain (**126**) of the n-channel MOS field effect transistor of an adjacent input protection circuit, and said drain (**126A**) of said n-channel MOS field effect transistor in each input protection circuit being located farther than said source (**122A**) of the same n-channel MOS field effect transistor from the drain (**126**) of the p-channel MOS field effect transistor of another adjacent input protection circuit.

5,182,622

CHARGE COUPLED DEVICE IMAGER HAVING MULTICHANNEL READOUT STRUCTURE

Tetsuya Iizuka; Kazuya Yonemoto; Kazushi Wada; Satoshi Nakamura, and Koichi Harada, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 725,935, Jun. 27, 1991, abandoned, which is a continuation of Ser. No. 475,013, Feb. 5, 1990, abandoned. This application Jun. 16, 1992, Ser. No. 899,221
Claims priority, application Japan, Feb. 14, 1989, 1-034569
Int. Cl.[5] H01L 29/78, 27/14, 31/00
U.S. Cl. 257—231 5 Claims



1. A CCD imager comprising

(a) an image area containing a plurality of photo-sensitive regions which generate electric charges;

(b) first and second juxtaposed read-out registers for transferring and reading out electric charges from the image area in one direction, the first read-out register being closer to the image area than the second read-out register;

(c) a transfer gate provided between the first read-out register and the second read-out register and being capable of transferring the electric charges from the first read-out register to the second read-out register;

(d) a first set of pairs of spaced apart transfer electrodes extending from the image area through the first and second read-out registers;

(e) a second set of pairs of spaced apart transfer electrodes extending from the image area through the first and second read-out registers;

(f) wherein one of the electrodes of each pair of the first and second sets of transfer electrodes is tapered to increase in width in the region of the first read-out register, the width of the tapered transfer electrode being taken in the direction of electric charge transfer in the first and second read-out registers, such that the tapered transfer electrodes are wider at the end near the second read-out register than at the end near the image area;

(g) a first channel stop region provided under the transfer gate and corresponding to the first set of transfer electrodes to prevent the electric charges flowing from the first read-out register to the second read-out register through the transfer gate; and

(h) a second channel stop region provided under the transfer gate and corresponding to the second set of transfer electrodes to guide the electric charges flowing from under a portion of the second set of transfer electrodes and corresponding to the first read-out register to under a portion of the first set of transfer electrodes corresponding to the second read-out register through the transfer gate;

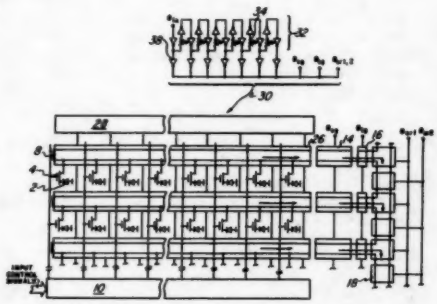
(i) wherein the first channel stop region and the second channel stop region both extend across the entire width of the tapered transfer electrodes to present the electric charges from flowing under the transfer gate to the tapered transfer electrodes.

5,182,623

CHARGE COUPLED DEVICE/CHARGE SUPER SWEEP IMAGE SYSTEM AND METHOD FOR MAKING

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 435,649, Nov. 13, 1989, abandoned.
This application Apr. 5, 1991, Ser. No. 682,858
Int. Cl.[5] H01L 29/78, 27/14, 31/00
U.S. Cl. 257—230 23 Claims



1. An image sensing system comprising:

a planar array of photosites in a semiconductor substrate, said photosites accumulating charge carriers proportional to incident radiation;

a series of elongate columnar charge transfer channels in said substrate coupled to receive said accumulated charge carriers from selected rows of said photosites;

a plurality of elongate members, each said member overlaying an associated one of said charge transfer channels;

a scanner, said scanner including a traveling wave driver circuit coupled to apply a traveling wave pulse to said plurality of elongate members, said pulse controlling movement of said accumulated charge carriers in said charge transfer channels; and

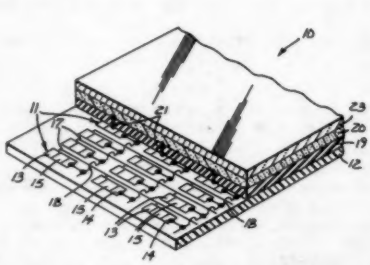
means for storing said accumulated charge for subsequent readout.

5,182,624

SOLID STATE ELECTROMAGNETIC RADIATION DETECTOR FET ARRAY

Nang T. Tran, Cottage Grove, Minn.; Neil W. Loeding, Wills Point, Tex., and David V. Nins, late of St. Paul, Minn. by Mary J. Nins, administrator , assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 8, 1990, Ser. No. 564,632
Int. Cl.[5] H01L 27/14
U.S. Cl. 257—40 31 Claims



1. A solid state detector for detecting electromagnetic radiation, comprising:

(a) a substrate;

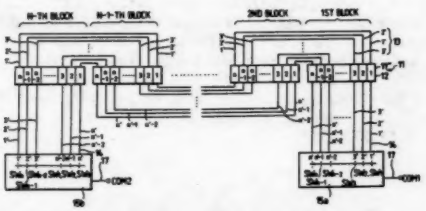
(b) a plurality of field effect transistors deposited onto the substrate to form an array wherein each field effect transistor has a gate electrode;
(c) a planarization layer deposited over the array of field effect transistors;
(d) an energy sensitive layer deposited onto the planarization layer;
(e) a plurality of bottom electrodes interposed between the planarization layer and the energy sensitive layer, wherein each bottom electrode is electrically coupled to the gate electrode of a single FET;
(f) a top electrode layer deposited onto the energy sensitive layer; and
(g) circuitry means for providing electronic read-out from each field effect transistor of the array.

5,182,625

IMAGE SENSOR AND METHOD OF MANUFACTURING THE SAME

Hiroyuki Miyake; Tsutomu Abe; Hisao Ito; Hiroyuki Hotta; Yasumoto Shimizu, and Yoshihiko Sakai, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1991, Ser. No. 691,517
Claims priority, application Japan, Apr. 26, 1990, 2-108920; Apr. 26, 1990, 2-108921; May 8, 1990, 2-116870; May 16, 1990, 2-125746
Int. Cl.[5] H01L *27/14, 31/00*
U.S. Cl. 257—443 **6 Claims**



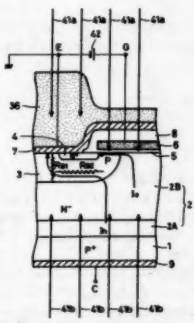
1. An image sensor comprising:
a photodetecting element array including a plurality of blocks linearly arrayed in a main scan direction, each block comprising a plurality of photodetecting elements;
a plurality of switching elements for transferring block charges generated in the plurality of photodetecting elements; and
drive means for outputting the block charges as image signals;
wherein the switching elements in a first block of the photodetecting element array and the switching elements in a second block of the photodetecting element array, located adjacent to the first block, are connected by first wires so that adjacent switching elements of first and second blocks are interconnected as a first coupled pair, the switching elements adjacent to the first coupled pair are interconnected as a second coupled pair, and wherein second wires connecting the switching elements in the first block to the switching elements in blocks adjacent to the first block are disposed perpendicular to the main scan direction, and are disposed so that a first wiring of the second wires, connecting the first coupled pair, is located adjacent to the photodetecting element array and, a second wiring of the second wires, connecting the second coupled pair is located adjacent to the first wiring.

5,182,626

INSULATED GATE BIPOLAR TRANSISTOR AND METHOD OF MANUFACTURING THE SAME

Hajime Akiyama, and Hisao Kondoh, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1990, Ser. No. 543,532
Claims priority, application Japan, Sep. 20, 1989, 1-245914
Int. Cl.[5] H01L *29/74*
U.S. Cl. 257—142 **5 Claims**



1. An insulated gate bipolar transistor, comprising:
a first semiconductor layer of a first conductivity type having first and second major surfaces;
a second semiconductor layer of a second conductivity type formed on said first major surface of said first semiconductor layer;
a first semiconductor region of the first conductivity type selectively formed on a surface of said second semiconductor layer;
a second semiconductor region of the second conductivity type selectively formed on a surface of said first semiconductor region;
an insulating film formed on the surface of said first semiconductor region between said second semiconductor layer and said second semiconductor region;
a control electrode formed on said insulating film;
a first main electrode formed lying over said first and second semiconductor regions; and
a second main electrode formed on said second major surface of said first semiconductor layer;
an amount of positive fixed charges in said insulating film being approximately equal to or much larger than an amount of levels in an interface between said insulating film and said first semiconductor region.

5,182,627

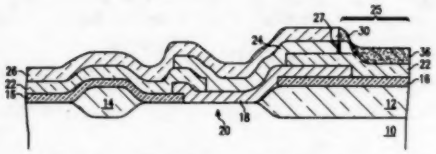
INTERCONNECT AND RESISTOR FOR INTEGRATED CIRCUITS

Fusen E. Chen; Girish A. Dixit, both of Dallas, and Robert O. Miller, The Colony, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Sep. 30, 1991, Ser. No. 769,171
Int. Cl.[5] H01L *29/04, 27/02, 29/34, 23/48*
U.S. Cl. 257—49 **9 Claims**

1. A structure consisting of a portion of a semiconductor integrated circuit, comprising:
a first conductive layer having a first region of a first conductivity type and a second region of a second conductivity type and having a junction between the first and second regions;
a first oxide region disposed over the first region, the junction

and a portion of the second region adjacent to the junction; and



a silicide region disposed over the portion of the second region not covered by the first oxide region.

5,182,628

SEMICONDUCTOR DEVICE HAVING PARTICULAR SOLDER INTERCONNECTION ARRANGEMENT

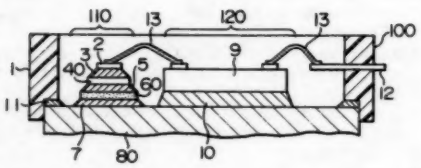
Katsuyoshi Izawa, Hitachi; Ryoichi Kobayashi, and Masayuki Ozawa, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 542,058, Jun. 22, 1990, abandoned. This application Oct. 10, 1991, Ser. No. 774,373

Claims priority, application Japan, Jun. 28, 1989, 1-163990

Int. Cl.[5] H01L *23/54, 23/34*

U.S. Cl. 257—707 **11 Claims**



1. A semiconductor device comprising:

(a) a semiconductor drive element;

(b) an insulation plate coupled to said semiconductor drive element through a first solder layer having a predetermined relatively high melting point; and

(c) a metallic heat sink plate coupled to said insulation plate through a second solder having a lower melting point than said first solder.

5,182,629

INTEGRATED CIRCUIT DIE HAVING A POWER DISTRIBUTION SYSTEM FOR AT LEAST TEN-THOUSAND BIPOLAR LOGIC CELLS

Matthew M. Nowak, San Diego; Roland D. Rothenberger, Poway, and Mark A. Vinson, San Diego, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 24, 1991, Ser. No. 782,019

Int. Cl.[5] H01L *23/48, 27/10*

U.S. Cl. 257—577 **15 Claims**

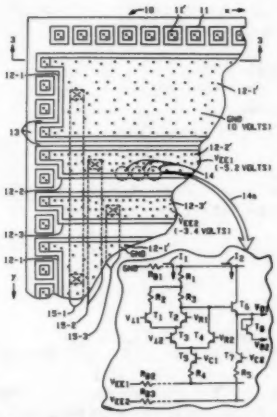
1. An integrated circuit die which is comprised of:

at least ten-thousand logic cells that are integrated into said die;

thin power busses that overlie and supply power to said logic cells;

an insulating layer which surrounds said power busses and which has elongated openings that expose major portions of said power busses to there define plating regions;

a plating film on said power busses throughout said plating regions; and,



thick plated conductors on said plating film throughout said plating regions.

5,182,630

SEMICONDUCTOR DEVICE HAVING A PARTICULAR SHAPED DIE PAD AND COATED LOWER SURFACE

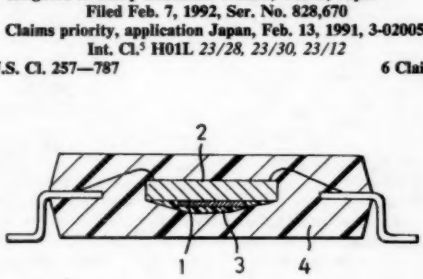
Susumu Omi, Tenri, and Kazuya Fujita, Nabari, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 7, 1992, Ser. No. 828,670

Claims priority, application Japan, Feb. 13, 1991, 3-020057

Int. Cl.[5] H01L *23/28, 23/30, 23/12*

U.S. Cl. 257—787 **6 Claims**



1. A semiconductor device comprising:

a semiconductor element having a mounting face;

a lead frame including a die pad having an upper surface on which said semiconductor element is mounted with said mounting face facing to said upper surface, said die pad having such an outer shape that a central portion of each sides opposed to each other is caved more inward than an outer shape of said mounting face;

a resin film coated on a lower surface of said die pad, and a portion of said mounting face exposed at said central portion of each side of said die pad which is opposed to each other; and

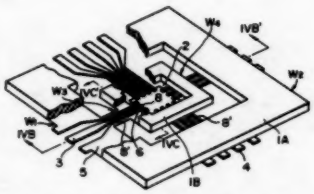
a package body comprising molding compound for encapsulating said semiconductor element, said die pad and said resin film,

said resin film comprising resin having a high adhesiveness with respect to said semiconductor element, said die pad and said molding compound of said package body.

5,182,631
FILM CARRIER FOR RF IC

Hisashi Tomimuro, Kanagawa; Fuminori Ishitsuka, Saitama; Nobuo Sato, and Takaaki Osaki, both of Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Continuation of Ser. No. 670,452, Mar. 8, 1991, abandoned, which is a continuation of Ser. No. 337,568, Apr. 13, 1989, abandoned. This application Apr. 29, 1992, Ser. No. 879,502
Claims priority, application Japan, Apr. 15, 1988, 63-91593
Int. Cl.[5] H01L *23/48*
U.S. Cl. 257—664 **2 Claims**



1. A waveguide film carrier for providing interconnections between electrode pads of a bare-chip semiconductor element and internal elements of a package, said waveguide film carrier comprising:

an insulating flexible film, on which a plurality of conductive areas is formed, said conductive areas comprising RF and DC bias electrodes and a portion of a ground electrode formed on one surface of said insulating flexible film, the remaining portion of said ground electrode formed on the other surface thereof,

said portion of the ground electrode formed on one surface of the insulating flexible film being connected to the remaining portion formed on the other surface via a through hole,

said RF and DC bias electrodes extending into openings of said insulating flexible film to make inner and outer leads, which include bumps formed at distal end portions of said inner and outer leads.

5,182,632
HIGH DENSITY MULTICHIP PACKAGE WITH INTERCONNECT STRUCTURE AND HEATSINK

Richard L. Bechtel, Sunnyvale; Mammen Thomas, San Jose, and James W. Hively, Sunnyvale, all of Calif., assignors to Tactical Fabs, Inc., San Jose, Calif.

Continuation of Ser. No. 440,545, Nov. 22, 1989, abandoned. This application Dec. 2, 1991, Ser. No. 804,614
Int. Cl.[5] H01L *23/34*
U.S. Cl. 257—713 **51 Claims**

1. A multichip package comprising:

a heatsink;

a plurality of spaced semiconductor integrated circuit chips thermally connected to said heatsink, said chips each having a plurality of I/O pads;

a multilayer interconnect structure placed near but spaced from said chips and including:

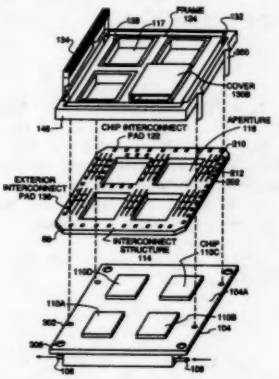
a plurality of chip interconnect pads for interconnecting to said chips,

a plurality of exterior interconnect pads for interconnecting to points exterior to said package; and

a plurality of interconnect lines, each of said lines interconnecting at least two of said pads;

means for electrically connecting said chip interconnect pads to selected ones of said I/O pads; and

means for electrically connecting said exterior interconnect pads to selected ones of said points exterior to said package;

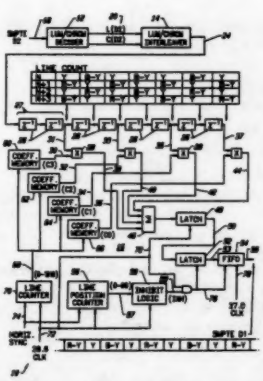


said interconnect structure including lines having line widths less than 10 microns.

5,182,633
VIDEO SAMPLE RATE CONVERTER

Robert C. Antonio, San Carlos; Phillip P. Bennett, Portola Valley, and Mark R. Andrews, Foster City, all of Calif., assignors to Abekas Video Systems, Inc., Redwood City, Calif.

Filed Apr. 12, 1991, Ser. No. 684,591
Int. Cl.[5] H04N *7/01, 11/02*
U.S. Cl. 358—11 **23 Claims**



1. A video sample rate converter for receiving an input interleaved digital component video signal having a first sample rate and providing an output interleaved digital component video signal having a second sample rate, wherein said second sample rate is lower than said first sample rate, said video sample rate converter comprising:

multi-tap finite impulse response digital filter means for receiving a plurality of parallel, time variant filter coefficient data signals, for receiving a first interleaved digital component video signal having a first sample rate and for providing a second interleaved digital component video signal in accordance with said received plurality of time variant filter coefficient data signals, wherein said second interleaved digital component video signal includes substantially duplicative and non-duplicative video data; and

output means coupled to said multi-tap finite impulse re-

sponse digital filter means for receiving said second interleaved digital component video signal and selectively outputting a filtered data signal having a second sample rate and representing said non-duplicative video data, wherein said second sample rate is lower than said first sample rate.

5,182,634

METHOD FOR ENCODING AND EXTENDED COMPOSITE TELEVISION SIGNAL WITH CROSSTALK COMPENSATION AND APPARATUS FOR DECODING

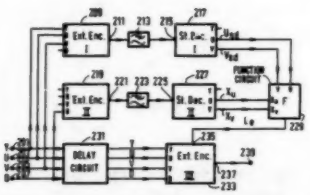
Marcel Führen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 3, 1990, Ser. No. 547,745

Claims priority, application Netherlands, Jul. 7, 1989, 8901741

Int. Cl.[5] H04N *11/06, 7/00, 11/00*

U.S. Cl. 358—12 **13 Claims**



1. An apparatus for decoding an extended television signal encoded compatibly with a conventional television signal, said extended television signal comprising a plurality of conventional television components, and an additional signal, at least one of said conventional television components being combined with a crosstalk precompensation signal, said apparatus comprising:

a) means for decoding said additional signal so as to obtain a decoded additional signal, and

b) means coupled to receive said decoded additional signal for obtaining and removing said crosstalk precompensation signal from said extended television signal.

5,182,635

COLOR STILL PICTURE TRANSMISSION SYSTEM

Hisaharu Nakashima; Hiroyuki Hayasaki; Masami Suzuki, all of Gifu; Yoshinori Saito, Aichi, and Hisasi Matuyama, Gifu, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 780,434, Oct. 11, 1991, abandoned, which is a continuation of Ser. No. 411,404, Sep. 22, 1989, abandoned. This application Jul. 14, 1992, Ser. No. 914,032

Claims priority, application Japan, Oct. 6, 1988, 63-252384

Int. Cl.[5] H04N *11/08, 7/14*

U.S. Cl. 358—12 **4 Claims**

1. A method for transmitting a color still picture in a video telephone system, comprising the steps of:

(a) converting a color image taken by a color video camera into a luminance signal and color difference signals;

(b) analog to digital converting the luminance signal and the color difference signals into luminance signal data and color difference signal data, respectively;

(c) storing the luminance signal data and the color difference signal data of at least one screen in a video memory;

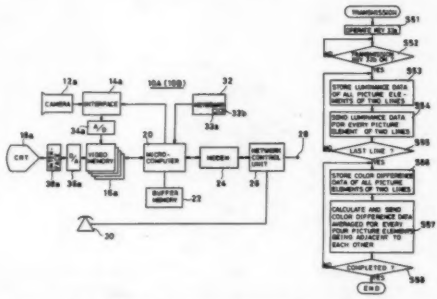
(d) displaying a color moving picture on the basis of the data read from the video memory;

(e) inhibiting the data stored in the video memory from being altered in response to an operation of a first key input means;

(f) transmitting the luminance signal data of one screen read from the video memory onto a telephone line through a modem in response to an operation of a second key input means;

(g) reading the color difference signal data of a plurality of lines from the video memory and temporarily storing the color difference signal data of the plurality of lines in a buffer memory means;

(h) calculating average data of the color difference signal data of a plurality of adjacent picture elements on the basis of the color difference signal data being temporarily



stored in the buffer memory means for each of the color difference signals;

(i) transmitting the average data for each of the color difference signals of the plurality of lines onto the telephone line through the modem;

(j) repeating the steps (g)–(i) until the completion of the transmission of all the lines of one screen; and

(k) connecting the telephone line to a speech telephone in response to a detection of the completion of transmission of the average data of one screen.

5,182,636

COLOR VIDEO CAMERA WITH AUTO-WHITE BALANCE CONTROL

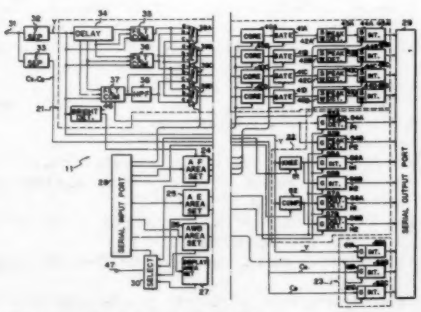
Akihiro Kikuchi, Chiba; Toshiharu Kondo, Kanagawa; Takashi Kohashi; Funiaki Kato, both of Chiba, and Katsuaki Hirota, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 12, 1991, Ser. No. 654,198

Claims priority, application Japan, Feb. 15, 1990, 2-034794

Int. Cl.[5] H04N *9/04*

U.S. Cl. 358—41 **5 Claims**



1. A color video camera comprising:

image pickup means having a light reception surface for providing color video signal components corresponding to a light image projected on said surface;

detecting means for detecting levels of said color video signal components which correspond only to at least

substantially white regions of said light image including means for sampling said color video signal components to provide pixel-by-pixel values thereof and means for determining which of said pixel-by-pixel values are within a predetermined range of white as defined by a black body radiation curve.

means for receiving only said pixel-by-pixel values which are determined to be within said range and for integrating the received pixel-by-pixel values so as to obtain average values thereof as white-balance detection signals; and

means for effecting white-balance control with reference to said white-balance detection signals derived from the color video components;

said detecting means further including means for varying said range in dependence upon the deviation of said white-balance detection signals from a relationship characteristic of a desired white-balance.

5,182,637

COLOR FACSIMILE APPARATUS

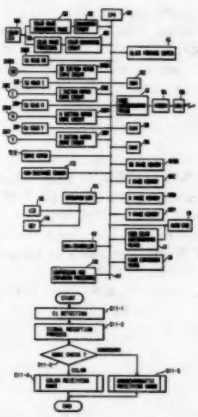
Kiyoharu Yoshioka, Yokohama, and Koji Arai, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1991, Ser. No. 670,256

Claims priority, application Japan, Mar. 16, 1990, 2-66113; Mar. 16, 1990, 2-66114; Mar. 16, 1990, 2-66115

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—75 **26 Claims**



1. A color facsimile apparatus comprising:

receiving means for receiving color data through a line;

means for forming an image corresponding to the color data received by said receiving means by depositing plural kinds of colorants, wherein said forming means is operable in two printing modes, a color printing mode and a monochromatic printing mode;

means for checking for non-depositing by said forming means; and

control means for controlling the printing mode of said forming means in accordance with said checking means.

5,182,638

DIGITAL COLOR COPYING MACHINE COMPRISING A TEST MODE FOR MAKING A COLOR ADJUSTMENT

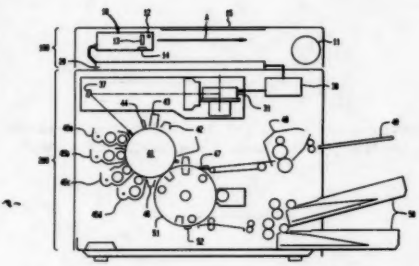
Toshio Tsuboi; Shigeru Moriya, and Keiji Nakatani, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 3, 1989, Ser. No. 431,078

Claims priority, application Japan, Nov. 8, 1988, 63-283245

Int. Cl.[5] G03F *3/08*; H04N *1/46, 1/00*

U.S. Cl. 358—80 **14 Claims**



1. A digital color copying machine comprising:

image reading means for scanning an original document image and generating image data;

color correcting means for making a color correction for said image data;

image forming means for forming the original document image on a recording medium in response to the image data corrected by said color correcting means;

mode selecting means for selecting a test mode;

area indicating means for indicating a partial area of the original document image;

memory means for storing the image data corresponding to the partial area indicated by said area indicating means;

control means for controlling said image forming means so as to form plural test images of the indicated partial area having different color balances on said recording medium by reading out said image data stored in said memory means when the test mode is selected and applying said read out image data to said color correcting means in order to make a color correction thereof with a color balance selected among predetermined color balances;

image selecting means for selecting any one of said plural test images formed by said control means; and

indicating means for indicating the state of the color balance with which the color correction is made for one of said plural test images selected by said image selecting means.

5,182,639

REAL-TIME ANALYTIC PSEUDOCOLOR ENCODER SYSTEM

Suganda Jutamulia, 38730 Lexington St., Apt. 274, Fremont, Calif. 94536; Akihiro Fujita, 10240 Parkwood Dr., #3, Cupertino, Calif. 95014; Shinji Toyoda, 10224 Parkwood Dr., #3, Cupertino, Calif. 95014; Atsushi Kojima, Pal Yanokuchi 202, 451-1 Yanokuchi 202 Inagi-city Tokyo, Japan, and Eiichi Ito, 81, Kaji-machi, Toyohashi-city Aichi-pref, Japan

Filed Oct. 30, 1991, Ser. No. 785,509

Int. Cl.[5] H04N *9/43*

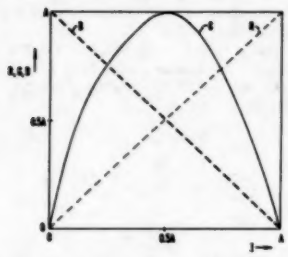
U.S. Cl. 358—81 **20 Claims**

1. An apparatus for generating a first, second and third pseudocolor video signals from monochromatic video signals having a range of possible amplitudes I between 0 and A, comprising:

means for generating a first pseudocolor video signal whose amplitude is proportional to that of the monochromatic video signal;

means for generating a second pseudocolor video signal

whose amplitude is proportional to the difference between A and that of the monochromatic video signal; and



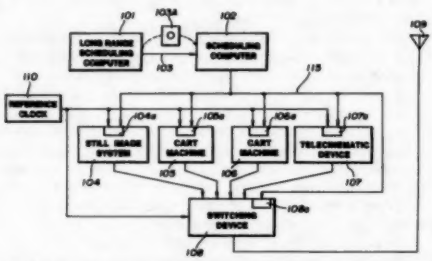
means for multiplying the first and second pseudocolor signals to provide the third pseudocolor video signal.

5,182,640

PROGRAM TRANSMISSION SYSTEM AND METHOD

Masayuki Takano, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 23, 1990, Ser. No. 512,448
Claims priority, application Japan, Apr. 27, 1989, 108775
Int. Cl.[5] H04N *7/10*
U.S. Cl. 358—86 **19 Claims**



1. A broadcast program transmission control apparatus, comprising:

a plurality of program generation devices each including respective device control means for each controlling the operation of its respective program generation device in real time;

scheduling data producing means for producing program scheduling signals representing a schedule of programs to be generated at predetermined future times by respective ones of said program generation devices;

each said respective device control means being operative to store corresponding ones of said program scheduling signals representing a corresponding schedule of programs to be generated by its respective program generation device;

means for loading each said device control means with said program scheduling signals from the scheduling data producing means representing the schedule of programs to be generated by its respective program generation device; and

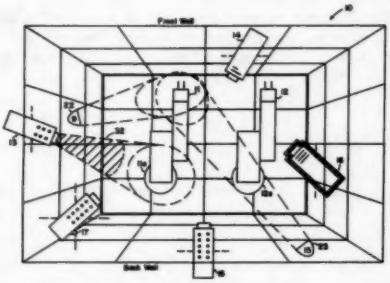
switching means for switching the programs generated by said program generation devices to a master broadcast output.

5,182,641

COMPOSITE VIDEO AND GRAPHICS DISPLAY FOR CAMERA VIEWING SYSTEMS IN ROBOTICS AND TELEOPERATION

Daniel B. Diner, Pasadena, Calif., and Steven C. Venema, Seattle, Wash., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 17, 1991, Ser. No. 716,150
Int. Cl.[5] H04N *7/18, 7/00*
U.S. Cl. 358—103 **37 Claims**



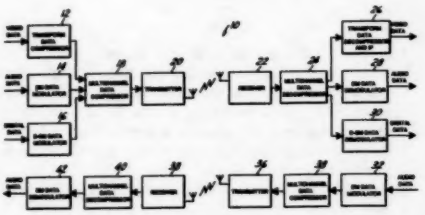
1. In a system for real-time video image display for robotics teleoperation having at least one robot arm or remotely operated vehicle controlled by an operator through hand controllers and one or more television cameras for viewing a workspace, said system having at least one television monitor for display of a television image from a selected one of said cameras, and optionally having one or more lighting elements, a method which comprises generating graphics for display surrounding said television image, said graphics including icons of any cameras and optionally icons of any lighting elements including in said system and said graphics including an indication of height and orientation of all icon-represented cameras and lighting elements relative to said workspace to provide said operator information as to position and orientation of each icon-represented camera and lighting element, and an indication of which camera is currently selected for image display on said monitor.

5,182,642

APPARATUS AND METHOD FOR THE COMPRESSION AND TRANSMISSION OF MULTIFORMAT DATA

Detlef G. Gersdorff, Sterling Heights; John J. Giganti, Allenton; Phillip W. McCown, and Timothy A. Sullivan, both of Sterling Heights, all of Mich., assignors to General Dynamics Lands Systems Inc., Warren, Mich.

Filed Apr. 19, 1991, Ser. No. 687,986
Int. Cl.[5] H04N *7/12*
U.S. Cl. 358—133 **92 Claims**



1. A multiformat data compression apparatus for a data transmission system having a transmitter at a remote site for

transmitting compressed data output by the multiformat data compression apparatus to a base site, the multiformat data compression apparatus having an analog video data input to receive from a video detector an electrical video signal representative of a video image, having an audio data input to receive from an audio detector an electrical audio signal representative of detected sound, and comprising:

transform data compression means for receiving and processing video data to provide in response thereto a compressed video data output signal;

delta modulation means for receiving and processing audio data to provide in response thereto a modulated audio data output signal; and

multichannel data compression means for receiving and processing data signals from a plurality of data sources including the transform data compression means and the delta modulation means to provide in response thereto a compressed composite data output signal for transmission by the transmitter to the base site.

5,182,643

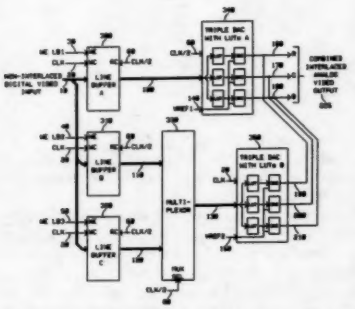
FLICKER REDUCTION CIRCUIT FOR INTERLACED VIDEO IMAGES

Paul T. Futscher, 8 Manson Ave., Kittery, Me. 03904

Filed Feb. 1, 1991, Ser. No. 649,476

Int. Cl.[5] H04N 7/01

U.S. Cl. 358—140 **33 Claims**



9. A circuit which combines, for each horizontal line of video signal input, a plurality of prior adjacent lines of video signal input with a plurality of following adjacent lines of video signal input, where each line consists of a plurality of pixels, to produce a time division multiplexed analog video signal, and which converts said horizontal line of video signal input to an analog video signal, and which combines said time division multiplexed analog video signal with said analog video signal to produce an interlaced analog video signal output, said circuit comprising:

processing means for receiving said plurality of prior adjacent lines of video signal input and said plurality of following adjacent lines of video signal input and providing therefrom a time division multiplexed signal comprising a plurality of time division units, where each of the time division units contains a portion of the video signal input corresponding to a single pixel within a single line selected from the group consisting of the prior and the following lines of video signal input, and where for each pixel position within said horizontal line of video signal input, corresponding pixels from said plurality of prior adjacent lines of video signal input and from said plurality of following adjacent lines of video signal input are contained in adjacent units of the time divisions;

first digital to analog signal conversion means for receiving said time division multiplexed signal at a sampling rate sufficient for sampling of the time division units and delivering said time division multiplexed analog video signal, and including means for biasing the amplitude of said time division multiplexed analog video signal;

second digital to analog signal conversion means for receiving said horizontal line of video signal input at a sampling rate sufficient for sampling of said horizontal line of video signal input and delivering said analog video signal, and including means for biasing the amplitude of said analog video signal; and

combining means for combining said time division multiplexed analog video signal with said analog video signal and delivering the corresponding sum analog video signal output suitable for driving an interlaced video output device.

5,182,644

MULTIPLEXED SIGNAL RECEIVING APPARATUS

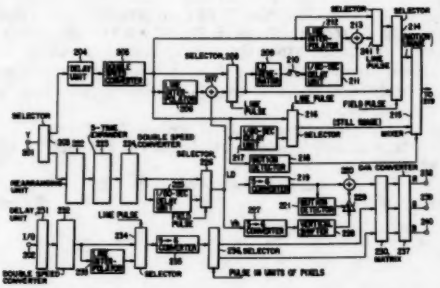
Yoshihide Kimata; Seijiro Yasuki; Yoshihiko Ogawa, and Kiyoyuki Kawai, all of Tokyo, Japan, assignors to Nippon Television Network Corp., Tokyo and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

Filed Jan. 21, 1992, Ser. No. 823,114

Claims priority, application Japan, Jan. 21, 1991, 3-20449

Int. Cl.[5] H04N 7/01

U.S. Cl. 358—140 **6 Claims**



1. A multiplexed signal receiving apparatus for receiving a transmitted multiplexed signal obtained by converting a first image signal for a screen wider than a screen obtained by an existing television signal to a signal which can be reproduced by a receiver of an existing television system, and for decoding the received multiplexed signal, comprising:

dividing means for receiving the multiplexed signal and dividing the multiplexed signal to a center portion signal and upper and lower black bar portion signals of the screen,

the multiplexed signal being converted such that a compressed second image signal has a center portion as an image display portion and upper and lower black bar portions as non-image portions when a vertical high-frequency component of the first image signal is band-limited along the temporal spatial frequency by a transmission side to obtain a second image signal, the second image signal is compressed in the vertical direction, and the compressed second image signal is matched to the screen of the receiver of the existing television system,

the upper and lower black bar portions being multiplexed with a difference signal (first LD signal) as a difference between an interpolated scanning line, obtained by performing interpolation by using a plurality of vertical interlace scanning lines of the second image signal, and a scanning line actually constituting the second image signal and corresponding to the interpolated scanning line,

first compensation signal reproducing means for reproducing the first LD signal from the upper and lower black bar portion signals obtained by said dividing means;

double speed converting means for double-speed converting the center portion signal obtained by said dividing means;

converting means for alternately selecting a direct scanning line output from said double speed converting means and a line-interpolated scanning line formed by using the direct scanning line and outputting a progressive scanning signal;

expanding means for expanding a signal obtained by said converting means in the vertical direction by an amount corresponding to that compressed on the transmission side, thereby obtaining an expanded signal;

first compensation signal synthesizing means for adding the first LD signal reproduced by said first compensation signal reproducing means to the interpolated scanning line of a first field used by said converting means;

second compensation signal reproducing means for generating a second LD signal from the progressive scanning signal compensated for by said first compensation signal synthesizing means in the same manner as on the transmission side; and

second compensation signal synthesizing means for adding the second LD signal to the interpolated scanning line of a second field used by said converting means.

5,182,645

APPARATUS FOR DERIVING A COMPATIBLE LOW-DEFINITION INTERLACED TELEVISION SIGNAL AND OTHER COMPONENTS FOR RECONSTRUCTING THE ORIGINAL SIGNAL FROM AN INTERLACED HIGH-DEFINITION TELEVISION SIGNAL

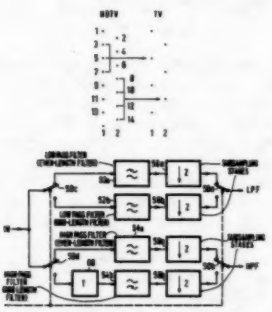
Marcel Breeuwer, and Peter H. N. De With, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 12, 1991, Ser. No. 714,284

Claims priority, application European Pat. Off., Jul. 11, 1990, 90201878.7

Int. Cl.[5] H04N *7/04, 7/12, 7/00*

U.S. Cl. 358—141 **15 Claims**



1. An apparatus for digitally processing a high definition television signal comprising interlaced first and second fields for digital recording or other signal transmission, said television signal comprising a main number of samples per field and having a main frequency range, said apparatus comprising:

(a) filter means for horizontally and vertically filtering said television signal so as to provide first, second, third and fourth auxiliary signals having first, second, third and fourth horizontal/vertical frequency ranges respectively which in combination comprise said main frequency range, said filter means comprising at least one filter having an even length for filtering said first field and at least one filter having an odd length for filtering said second field;

(b) subsampling means coupled to said filter means, for subsampling said first, second, third and fourth auxiliary signals so as to provide first, second, third and fourth numbers of samples per field respectively, wherein the sum of said first, second, third and fourth numbers of samples per field does not exceed said main number of samples per field.

5,182,646

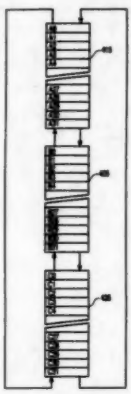
LINKABLE SCAN LISTS FOR A TELEVISION RECEIVER

Douglas M. Keenan, Noblesville, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Sep. 24, 1990, Ser. No. 589,830

Int. Cl.[5] H04N *5/50*

U.S. Cl. 358—193.1 **2 Claims**



1. A television receiver, comprising:

a plurality of radio frequency (RF) signal input terminals, each of which receives a group of RF signals from respective RF signal sources;

RF switch means having a plurality of inputs, each of which is connected to a respective one of said RF input terminals, said RF switch means having an output at which is developed a selected one of said groups of RF signals, said RF input switch having a control input for receiving a first control signal for selecting said selected one of said groups of RF signals;

tuner means coupled to said RF switch means for receiving said selected group of RF signals, said tuner means selecting a particular RF signal from said group of RF signals in response to a second control signal;

control means for generating said first and second control signals for causing said RF switch means to select an appropriate one of said groups of said RF signals and for causing said tuner means to select said particular RF signal;

means, coupled to said control means, for entering data in response to operation by a user;

memory means having a plurality of areas for storing data related to the tuning of ones of said RF signals which are preferred by a user, each of said areas storing tuning information specific to the RF signals of a respective one of said groups of RF signals received at one of said RF input terminals;

wherein in response to ones of said data entered by said user corresponding to one of a CHANNEL UP and a CHANNEL DOWN command, said control means sequentially retrieves said tuning data from said memory means in one of a linked mode in which said control means automatically retrieves said tuning data from a second one of said areas after having completed the sequential retrieval of said tuning data from said first area, and an unlinked mode in which said control means automatically begins the sequential retrieval of said tuning data from said first area

upon completion of said sequential retrieval of said tuning data from said first area;

said control means automatically generating said first control signal for selecting the respective one of said RF input terminals which is related to the memory area from which said tuning data is to be retrieved; and

said control means selecting said linked and unlinked modes in response to data entered by said user corresponding to a command code for causing said control means to change operating modes between said linked mode and said unlinked mode.

5,182,647

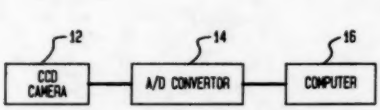
HIGH RESOLUTION CHARGE-COUPLED DEVICE (CCD) CAMERA SYSTEM

Win-Chyi Chang, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 13, 1990, Ser. No. 627,136

Int. Cl.[5] H04N *5/335*

U.S. Cl. 358—213.11 **5 Claims**



1. A camera system comprising:

a computer adapted to receive at an input thereof input data and to analyze the output signals of a CCD camera;

a high resolution CCD camera having at least one million pixels and operating at a low data rate of between 1 and 2.5 MHz compatible with the input data rate of the computer, said camera having a CCD image sensor which is capable of operation in a mode where holes are accumulated at room temperature to reduce any dark current, and

an A/D converter directly coupling an output of the CCD camera to the input of the computer.

5,182,648

CHARGE COUPLED DEVICE IMAGER WITH HORIZONTAL CHARGE TRANSFER SECTION IN AN IMAGING SECTION

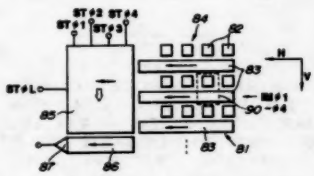
Isao Hirota, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed Sep. 13, 1990, Ser. No. 583,969

Claims priority, application Japan, Sep. 14, 1989, 1-239503; Sep. 14, 1989, 1-239504; Sep. 14, 1989, 1-239505

Int. Cl.[5] H04N *5/335*

U.S. Cl. 358—213.11 **5 Claims**



1. A charge coupled device imager comprising:

an imaging section including a plurality of photoelectric converting sections arrayed in a matrix configuration for generating signal charges, a plurality of horizontal charge transfer sections arranged between horizontal rows of the photoelectric converting sections for transferring the signal charges via a readout section in a horizontal direction;

a storage section having a plurality of horizontal storage register for transferring the signal charges in the horizontal direction and in the vertical direction line by line; and

output means, including readout means coupled to said storage section and including a horizontal register for reading out image signals from the signal charges;

said storage section including a plurality of transfer electrodes juxtaposed in the horizontal direction and elongated in the vertical direction, a plurality of vertical transfer gates provided between the horizontal storage register sections and channel stop regions formed under the vertical transfer gates for isolating between the same phase potential well in the juxtaposed horizontal storage registers;

wherein the signal charges are transferred in the horizontal direction when the plurality of vertical transfer gates are interrupted and the signal charges are transferred in the vertical direction when the plurality of vertical transfer gates are conducted.

5,182,649

AUTOMATIC FOCUS CONTROL DEVICE

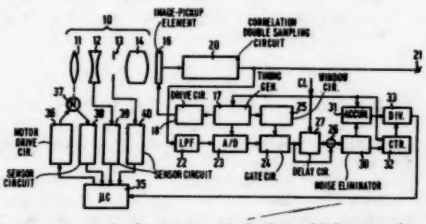
Akihiko Miyazaki, Tokyo, Japan, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1991, Ser. No. 696,442

Claims priority, application Japan, May 11, 1990, 2-122664

Int. Cl.[5] H04N *5/232;* **G03B** *3/00, 13/18*

U.S. Cl. 358—227 **3 Claims**



1. An automatic focus control device which comprises a camera lens, an image sensor element for converting optical information of a subject received through the camera lens into a video signal and control means for moving the camera lens in accordance with a focus control signal produced based on the video signal, wherein said automatic focus control device comprises a differentiation circuit for differentiating the video signal to form differentiating values thereof; an accumulator for successively accumulating said differentiated values and producing output signals indicative of said differentiated values; a time measuring circuit for measuring time periods during which said differentiated values exceed a predetermined value and for producing output signals representative of said time periods; and a divider for dividing output signals of said accumulator by output signals of said time measuring circuit and producing output signals indicative of divisions of said signals; and wherein the focus control signal is obtained from output signals of said divider.

5,182,650

INFORMATION PROCESSING APPARATUS CAPABLE OF CONNECTING PRINTER

Naoshi Inoue, Tokyo; Shigeo Yoshida, Yokohama, and Toshio Sugino, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1991, Ser. No. 652,430

Claims priority, application Japan, Feb. 13, 1990, 2-31696

Int. Cl.[5] H04N *1/23;* **G03G** *21/00*

U.S. Cl. 358—296 **10 Claims**

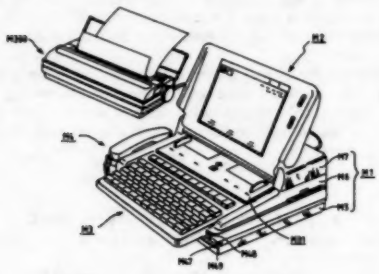
1. A processing method for an information processing apparatus capable of connecting a plurality of types of printers, at

least one of which can mount a cut sheet feeder, and capable of producing record data to be supplied to the printers, said method comprising the steps of:

providing connection means for electrically connecting a printer;

discriminating the type of printer connected to said connection means;

determining whether the cut sheet feeder is mounted on the printer;



controlling the printer connected to said connection means to execute a paper supply operation; and

controlling the printer to execute a paper feed operation in accordance with the type of printer as discriminated in said discrimination step and in accordance with a determination of whether the cut sheet feeder is mounted as determined in said determining step, after the printer executes the paper supply operation.

5,182,651

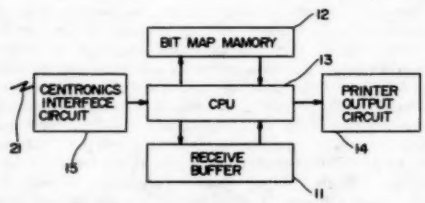
METHOD OF CONTROLLING THE RECEPTION OF DATA

Hiroshi Kishi, Amagasaki, Japan, assignor to Mita Industries Co., Ltd., Osaka, Japan

Continuation of Ser. No. 593,286, Oct. 3, 1990, abandoned, which is a continuation of Ser. No. 79,238, Jul. 29, 1987, abandoned. This application Jun. 24, 1992, Ser. No. 905,086

Int. Cl.[5] H04N *1/21*

U.S. Cl. 358—296 **6 Claims**



1. A method for controlling the reception of data comprising the steps of;

storing data in a plurality of 1-page units in a receiver buffer capable of storing said plurality of 1-page units, said stored 1-page units of data being capable of being read out from said receive buffer one or more times;

reading out said stored 1-page units of data from said receive buffer sequentially;

establishing a page pointer for each of said stored 1-page units of data for indicating an associated starting address for said stored 1-page unit when it is read out from said receive buffer;

rereading out said 1-page units whose associate starting addresses are indicated by the page pointers when rereading-out of said associated 1-page units for a second time is required to effectuate printing of the same data as initially read out by said reading out of said 1-page units;

erasing the first established one of said page pointers for said stored 1-page units whenever a predetermined number of said stored 1-page units having said page pointers are stored together in said receive buffer; and

writing new data in a data area storing the 1-page unit of data whose page pointer has been erased.

5,182,652

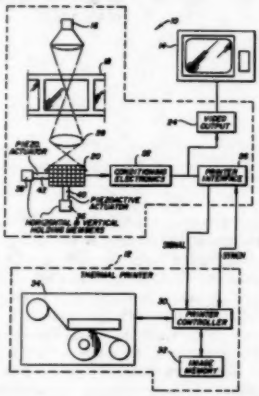
HIGH RESOLUTION THERMAL PRINTING BY IMAGING A HARD COPY IMAGE IN VERTICAL AND HORIZONTAL INCREMENTS SMALLER THAN THE PIXEL PITCH OF A VIDEO IMAGER ARRAY

Stanley W. Stephenson, III, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 6, 1991, Ser. No. 755,889

Int. Cl.[5] H04N *1/028, 1/04, 1/21, 1/23, 1/40*

U.S. Cl. 358—296 **17 Claims**



9. An apparatus for generating a high resolution thermal image from a video imager having a plurality of pixels with a preselected pitch, comprising:

means for dithering said video imager at less than the pitch of said pixels and producing arrays of data representing video imager positions generated by partial offsets of said video imager in horizontal and vertical directions so that a partial step movement of the video imager causes said pixels to map a new horizontal and vertical area of an image without overlap of a previously mapped area said video imager coupled to said means.

5,182,653

Patent Not Issued For This Number

5,182,654

METHOD AND APPARATUS FOR OBTAINING IDENTICAL OUTPUT SIGNALS FROM TIME BASE CORRECTOR UNIT HAVING VARIABLE OR DIFFERENT ELECTRICAL CHARACTERISTICS USING A VIDEO TAPE OF KNOWN PARAMETERS

Glenn Sanders, 17-12 Bellaire Ave., Fairlawn, N.J. 07410

Filed Feb. 21, 1990, Ser. No. 482,640

The portion of the term of this patent subsequent to Jul. 30, 2008, has been disclaimed.

Int. Cl.[5] H04N *9/89*

U.S. Cl. 358—320 **7 Claims**

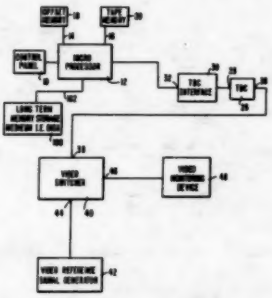
1. A method adapted for use with a time base corrector unit to obtain a set of offset signal values to be associated with this unit, the unit being capable of playing a video tape to produce a corresponding output video signal containing the viewing

parameters video gain, chroma gain, set up and hue, the method employing a tape having a known set of parameter values and carrying test patterns, a source of a standard reference video signal, and a source of a variable offset signal, said method comprising the steps of:

[a] adjusting the viewing parameter settings of the unit to conform to the known set of parameter values;

[b] playing the tape in the unit, thus producing a test pattern video output signal;

[c] displaying the output signal together with the reference



signal, the reference signal containing the same parameters but with different values;

[d] applying an offset signal to the input of the unit; and

[e] varying the offset signal to vary the video output signal for each parameter in turn until the said each parameter of the varied output signal is visually identical to that of the standard reference signal, thereby obtaining a set of offset signal values associated with the unit, each value in the set being associated with a different parameter.

5,182,655

FACSIMILE APPARATUS HAVING A RECHARGEABLE BATTERY

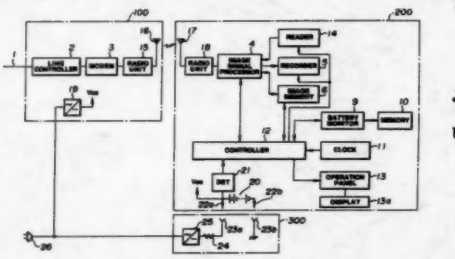
Teruo Motoyanagi, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 13, 1991, Ser. No. 744,106

Claims priority, application Japan, Aug. 20, 1990, 2-217171

Int. Cl.[5] H04N *1/00*

U.S. Cl. 358—406 **12 Claims**



1. A facsimile apparatus driven by a rechargeable battery, comprising:

charged quantity measuring means for measuring a charged quantity of the battery by measuring time for which the battery is charged;

discharged quantity measuring means for measuring a discharged quantity of the battery by measuring time for which said facsimile apparatus has been operated;

calculating means for calculating the quantity of electric charges remaining in the battery from the charged quantity of the battery measured by said charged quantity measuring means and the discharged quantity of the battery measured by said discharged quantity measuring means; and

means for informing a facsimile operator of an attribute data concerning an operable time of the facsimile apparatus driven by the battery in accordance with the quantity of electric charges remaining in the battery calculated by said calculating means,

wherein said facsimile apparatus is operable in a plurality of operation modes and said discharged quantity measuring means measures the discharged quantity of the battery in correspondence to the operation modes of the facsimile apparatus.

5,182,656

METHOD FOR COMPRESSING AND DECOMPRESSING FORMS BY MEANS OF VERY LARGE SYMBOL MATCHING

Dan S. Chevion, Haifa; Ehud D. Karnin, and Eugeniusz Walach, both of Kiryat Motzkin, all of Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1990, Ser. No. 559,813

Claims priority, application Israel, Aug. 4, 1989, 91220

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—452 **13 Claims**

1. Method for compressing, for storing or transmitting, information contained in filled-in forms by separate handling of the corresponding empty forms and of the information written into them, characterized by the steps of:

pre-scanning the empty forms, digitizing data obtained, and storing digitized representations relating to each of the empty forms in a computer memory to create a form library,

scanning the original, filled-in form to be compressed, digitizing data obtained from the filled in form,

identifying a particular one of said empty forms in said forms library and retrieving the digital representation thereof,

subtracting said retrieved digital representation of the empty form from said digital representation of the scanned filled-in form, to generate a difference which is a digital representation of the filled-in information, and

compressing the digital representation of the filled-in information.

5,182,657

IMAGE PROCESSING APPARATUS INCLUDING BINARY DATA PRODUCING UNIT

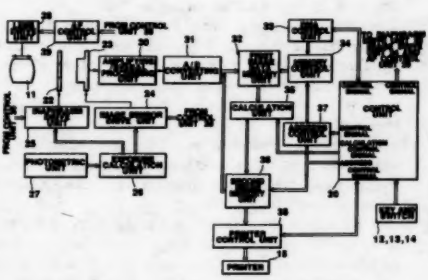
Takashi Sato, Higashiyamato, and Teruo Sano, Kawasaki, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1990, Ser. No. 513,566

Claims priority, application Japan, Apr. 27, 1989, 1-108795; Jun. 12, 1989, 1-149194

Int. Cl.[5] H04N *1/04*

U.S. Cl. 358—465 **14 Claims**



1. An image processing apparatus comprising:

image sensing means having a plurality of photoelectric converting elements arranged in rows and columns in a matrix form, for outputting electric signals of an optical image converted by said photoelectric converting elements;

selecting means for selecting said electric signals produced by an n×n ("n" being an integer) array of said photoelectric converting elements;

arithmetic means for producing an average value of said electric signal selected by said selecting means; and

binary data producing means for producing binary data in response to electric signals produced by an m×m ("m" being an integer) array of said photoelectric converting elements which produce the electric signal selected by said selecting means, with said average value produced by said arithmetic means as a threshold value.

5,182,658

IMAGE PICKUP APPARATUS FOR CONTROLLING ACCUMULATION TIME IN PHOTOELECTRIC ELEMENTS

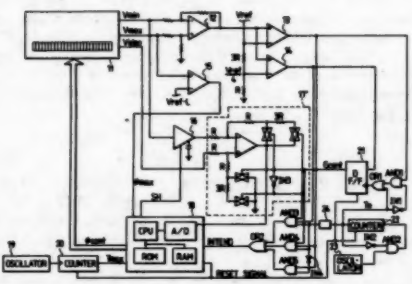
Akira Ishizaki; Kenji Suzuki; Keiji Ohtaka, and Yasuo Suda, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 384,449, Jul. 25, 1989, abandoned. This application Aug. 28, 1991, Ser. No. 758,303

Claims priority, application Japan, Jul. 27, 1988, 63-187270; Jul. 27, 1988, 63-187271

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—483 **12 Claims**



1. An image pickup apparatus comprising:

a) an image pickup means comprising a plurality of photoelectric converting elements, each photoelectric converting element converting light incident thereon into an electrical image signal and accumulating the converted electrical signal for an accumulation time;

b) first signal generating means for generating a first signal during the accumulation time, said first signal indicating whether a level of a predetermined one of the electrical image signals being accumulated by said plurality of photoelectric converting elements has reached a first predetermined level;

c) second signal generating means for generating a second signal which indicates whether the accumulation time of the electrical image signals in said image pickup means has reached a predetermined time; and

d) control means for controlling a completion of the accumulation of the electrical image signals in said image pickup means according to one of said first and second signals generated by said first and second signal generating means.

5,182,659

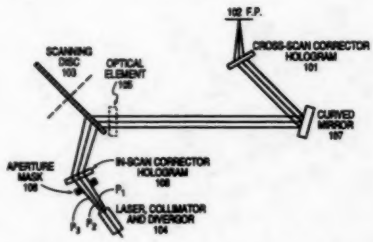
HOLOGRAPHIC RECORDING AND SCANNING SYSTEM AND METHOD

Burton R. Clay, Wayland, and David M. Rowe, Bellingham, both of Mass., assignors to Holographix, Inc., Waltham, Mass.

Filed Feb. 20, 1991, Ser. No. 657,915

Int. Cl.[5] G02B *5/32, 26/10*

U.S. Cl. 359—17 **34 Claims**



1. A system for forming an image on a focal plane comprising:

means for emitting a light beam;

a first hologram placed relative to said means for emitting to deflect and focus said light beam onto said focal plane;

a second hologram for correcting cross-scan error of said light beam on said focal plane; and

a third hologram for correcting in-scan error of said light beam on said focal plane.

5,182,660

BACK-LIGHT TYPE LIQUID CRYSTAL DISPLAY

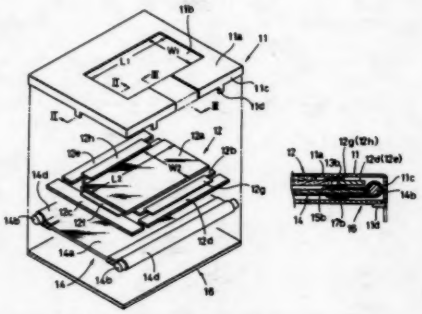
Osamu Tanaka, Higashiosaka, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jul. 2, 1991, Ser. No. 724,791

Claims priority, application Japan, Aug. 3, 1990, 2-83038[U]; Aug. 3, 1990, 2-83040[U]

Int. Cl.[5] G02F *1/1335, 1/1333*

U.S. Cl. 359—49 **12 Claims**



1. A liquid crystal display comprising:

a fixing frame having a front wall formed with a display window, said frame also having a peripheral wall;

a liquid crystal panel device received in said frame, said panel device having a marginal edge spaced from said peripheral wall of said frame to define an accommodating space between said marginal edge and said peripheral wall; and

a back lighter received in said frame and stacked to said panel device on the side thereof away from said window for illuminating said panel device from behind, said back

lighter including a flat light guide which has at least one marginal edge provided with a cylindrical lamp extending along said marginal edge of said light guide, said light guide having a front surface located closer to said display window and a rear surface located away from said display window, the diameter of the lamp being larger than the thickness of said light guide;

wherein said lamp is located laterally outwardly of a corresponding edge of said panel device, said lamp being substantially flush with said rear surface of said light guide but projecting beyond said front surface of said light guide in the direction of said front wall,

wherein said lamp projects into said accommodating space to overlap partially said panel device in the direction of said front wall.

5,182,661

THIN FILM FIELD EFFECT TRANSISTOR ARRAY FOR USE IN ACTIVE MATRIX LIQUID CRYSTAL DISPLAY

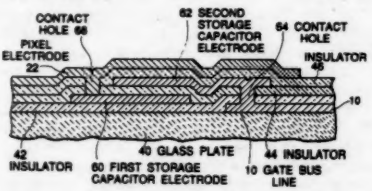
Naoyasu Ikeda, and Ken-ichi Nakamura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 25, 1991, Ser. No. 720,340

Claims priority, application Japan, Jun. 25, 1990, 2-165907

Int. Cl.[5] G02F 1/13

U.S. Cl. 359—54 **15 Claims**



1. A thin film field effect transistor array comprising a transparent insulative substrate, a plurality of parallel gate bus lines formed on said transparent insulative substrate, a plurality of parallel drain bus lines formed on said transparent insulative substrate so as to intersect said gate bus lines, a plurality of pixel electrodes each formed in proximity of a corresponding one of intersections between said gate bus lines and said drain bus lines, a plurality of thin film field effect transistors each formed in proximity of a corresponding one of intersections between said gate bus lines and said drain bus lines, each of said thin film field effect transistors being connected to a corresponding one of said pixel electrodes, and a plurality of storage capacitors each formed in proximity of and connected in parallel to a corresponding one of said pixel electrodes, each of said storage capacitors being formed of a stacked structure having at least first, second and third level capacitor electrodes which are stacked in the named order and separated from each other by an intervening insulating layer, at least one of said first, second and third level capacitor electrodes being connected to a corresponding one of said gate bus lines, wherein said gate bus line is formed on the transparent insulative substrate and a first insulator layer is formed to cover said gate bus line, wherein said first level capacitor electrode is formed on said first insulator layer so as to be offset from said gate bus line and a second insulator layer is formed to cover said first level capacitor electrode, wherein said second level capacitor electrode is formed on said second insulator layer so as to partially overlap said gate bus line and said first level capacitor electrode, said second level capacitor electrode being connected to said gate bus line through a contact hole formed to pierce through said first and second insulator layers, and said third insulator layer is formed to cover said second level capacitor electrode, and wherein said third level capacitor electrode is formed of said pixel electrode which is formed on said third insulator layer so as to overlap said second level capacitor electrode, said pixel electrode being connected to said first level capacitor electrode through a contact hole formed to pierce through said second and third insulator layers.

5,182,662

LIQUID CRYSTAL DEVICE

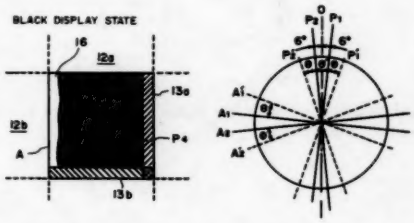
Tadashi Mihara, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1990, Ser. No. 620,052

Claims priority, application Japan, Dec. 1, 1989, 1-310732

Int. Cl.[5] G02F 1/13

U.S. Cl. 359—63 **6 Claims**



1. A liquid crystal device, comprising: a pair of substrates having thereon opposite electrodes, a ferroelectric smectic liquid crystal disposed between the electrodes so as to have two stable molecular orientation states, and a polarizer and an analyzer disposed adjacent to the substrates so that one of the two stable molecular orientation states provides a dark state and the other of the two stable molecular orientation states provides a bright state; wherein a domain with a minor areal size changing with time is formed in an effective display area, and the polarizer and the analyzer are disposed so that the domain is present in a bright state of the effective display area wherein, from the first positions as a basic position of said polarizer and analyzer where said polarizer and analyzer are disposed in a cross nicol relationship and so as to provide the darkest state in one of the two stable molecular orientation states of the smectic liquid crystal, the polarizer and analyzer are rotated by an angle θ, while retaining the cross nicol relationship, in a direction providing a brighter bright state given by the other stable molecular orientation state, the angle θ satisfying the condition of:

$$\theta \leqq 45 \text{ degrees} - \theta',$$

wherein θ' denotes an angle between the transmission axes of the polarizer or analyzer int he first position and in a second position where the polarizer and analyzer are disposed to retain the cross nicol relationship and so as to provide the darkest state in the other molecular orientation state of the smectic liquid crystal.

5,182,663

LIQUID CRYSTAL DISPLAY HAVING IMPROVED RETROREFLECTOR

Philip J. Jones, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

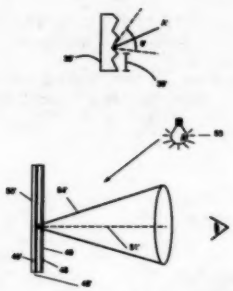
Filed Aug. 30, 1991, Ser. No. 752,729

Int. Cl.[5] G02F 1/12

U.S. Cl. 359—70 **20 Claims**

1. A liquid crystal display comprising (a) a first transparent electrode means; (b) a second transparent electrode means; (c) a display medium positioned between the first and second transparent electrode means, which display medium is switchable between a first state in which incident light is scattered and a second state in which the amount of such scattering is reduced; and (d) a retroreflector positioned behind the second

transparent electrode means, which retroreflector comprises an array of full corner cube elements and has an optic axis



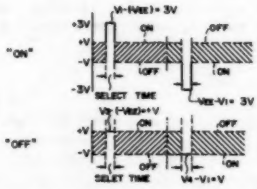
tilted towards the top of the display by an angle of between about 10° and about 45°.

5,182,664

LIQUID CRYSTAL DISPLAY HAVING ELECTRICALLY CONTROLLED BIREFRINGENCE

Jean-Frédéric Clerc, Tokyo, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 629,488
Claims priority, application Japan, Dec. 21, 1989, 1-332339
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—93 **7 Claims**



1. A liquid crystal display apparatus having a common electrode and a segment electrode which are periodically driven at each driving frame time, comprising:

a pair of substrates having tilt orientation directions parallel to each other and being capable of orientating liquid crystal molecules homeotropically or pseudo-homeotropically at an angle range of from 0° to about 20°; and

a layer of nematic liquid crystal molecules disposed between said pair of substrates to form a cell having properties of negative dielectric anisotropy and containing substantially no chiral molecules, said cell having a response time shorter than the driving frame time,

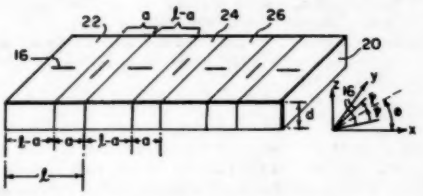
the tilt orientation directions of said substrates and said properties of said cell causing said liquid crystal layer to not be twisted in an "OFF" state and to be spontaneously twisted in an "ON" state in which a pulse voltage is applied between the common electrode and the segment electrode.

5,182,665

DIFFRACTIVE LIGHT MODULATOR

Michael J. O'Callaghan, Louisville, and Mark A. Handschy, Boulder, both of Colo., assignors to Displaytech, Inc., Boulder, Colo.

Filed Sep. 7, 1990, Ser. No. 578,647
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—95 **44 Claims**



1. An apparatus for modulating light comprising:

first and second plates;

at least one birefringent layer disposed between said plates having an optic axis selectably disposed in one of a first orientation and a second orientation, said first and second orientations of said optic axis having a relative difference of 90° and a same angle to a perpendicular of said plates, light having passed through said birefringent layer at locations with said first orientation having a phase difference of an odd-integral number of half-waves from and same polarization as light having passed through locations with said second orientation independent of a polarization state of light incident on said apparatus, said birefringent layer having at least two regions, one of said two regions corresponding to a first region type and another of said two regions corresponding to a second region type; and

first means for controlling whether said optic axis is in said first or second orientation at regions of said birefringent layer corresponding to said first region type, said regions corresponding to said first region type having a total area equal to a total area of regions corresponding to said second region type, said phase difference between said first and second orientations causing complete diffraction of said light incident on said apparatus.

5,182,666

ORGANIC OPTICAL LOGIC DEVICE

Yutaka Kawabe, Sodegaura, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1992, Ser. No. 826,831
Claims priority, application Japan, Jan. 28, 1991, 3-025003
Int. Cl.[5] G02F 3/00, 1/35; F21V 9/00
U.S. Cl. 359—107 **15 Claims**

1. An organic optical logic device comprising a nonlinear optical medium which is a crystal of organic molecules, the organic molecules being excited to a state of electronic excitation with an oscillator strength of at least 1.0 by a visible or near-infrared radiation within a region of wavelengths of 0.4 to 1.3 μm, and the organic optical logic device being driven with

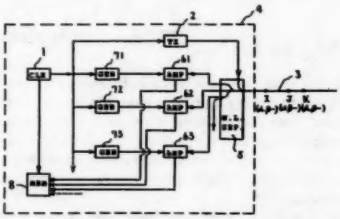
a driving light having a wavelength of λ_o-50 nm to λ_o+50 nm, when the electronic excitation of the crystal generates excitons or exciton polaritons having a resonance wavelength of λ_o.

5,182,667

METHOD OF RECEIVING WAVELENGTH MULTIPLEX SIGNALS

Akiji Shibata, and Nobuo Ando, both of Hitachi, Japan, assignors to Hitachi Cable Limited, Tokyo, Japan

Filed May 16, 1991, Ser. No. 701,549
Claims priority, application Japan, May 18, 1990, 2-129949
Int. Cl.[5] H04J *14/02*
U.S. Cl. 359—124 **8 Claims**



1. A method of receiving wavelength multiplexed optical signals at the end of an optical fiber transmission path, wherein said multiplexed signals are transmitted in response to an optical trigger signal and represent multiple kinds of information respectively from a plurality of information sources distributed along said transmission path at essentially constant intervals, comprising the step of:

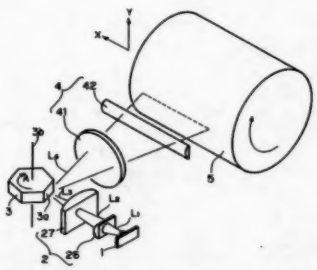
sampling said wavelength multiplexed optical signals respectively at time intervals inversely proportional to the light propagation velocities of said multiplexed signals, whereby the content, kind and source of information of each of said multiplexed signals may be identified at the end of said transmission path.

5,182,668

OPTICAL BEAM SCANNING SYSTEM HAVING AN IMAGE-FORMING SYSTEM FOR RESHAPING A LIGHT BEAM TO BE APPLIED TO A SCANNING REFLECTOR

Motonobu Kawabata, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Sep. 20, 1991, Ser. No. 764,143
Claims priority, application Japan, Sep. 21, 1990, 2-253745
Int. Cl.[5] G02B *26/00*
U.S. Cl. 359—218 **11 Claims**



1. An optical beam scanning system, comprising:

(a) a light source for emitting a diverging light beam;

(b) a deflector for deflecting said light beam in a first direction;

(c) a first image-forming system for converging said light beam from said light source onto said deflector with respect to a second direction, said second direction being perpendicular to said first direction,

said first image-forming system consisting essentially of a first lens system disposed between said light source and said deflector, said first lens system having zero or a negative power along said first direction and having a positive power along said second direction, and a second lens system disposed between said first lens system and said deflector, said second lens system having a positive power only along said first direction; and

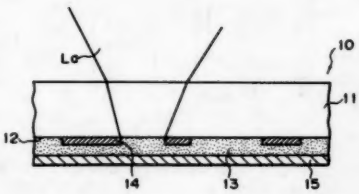
(d) a second image forming system for focussing said light beam in said first and second directions on a surface to be scanned.

5,182,669

HIGH DENSITY OPTICAL DISK AND METHOD OF MAKING

Kiyofumi Chikuma, and Kiyoshi Takei, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 637,686, Jan. 7, 1991, abandoned. This application Jun. 24, 1992, Ser. No. 902,422
Claims priority, application Japan, Jun. 4, 1990, 2-145916
Int. Cl.[5] G11B *3/70*
U.S. Cl. 359—241 **6 Claims**



3. An optical information recording disk comprising;

a transparent substrate;

a reflection layer formed on one flat main surface of said substrate having a track of a plurality of minute through holes formed thereon;

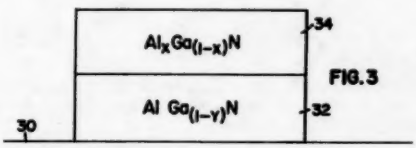
a light-emitting member with which said through holes are filled, said light-emitting member absorbing a laser beam and emitting a light of a wavelength different from that of the irradiated laser beam.

5,182,670

NARROW BAND ALGAN FILTER

Muhammad A. Khan, White Bear Lake; Jonathon N. Kuznia, Bloomington, and James M. Van Hove, Eagan, all of Minn., assignors to APA Optics, Inc., Blaine, Minn.

Filed Aug. 30, 1991, Ser. No. 755,510
Int. Cl.[5] G02B *5/28*; F21V *9/04*; H01L *27/14*
U.S. Cl. 359—359 **24 Claims**



1. A filter device of at least two layers, said first layer comprising

$Al_xGa_{(1-x)}N$

wherein x has a value ranging from about 0 to 1, and said device second layer comprising

$Al_yGa_{(1-y)}N$

wherein y has a value ranging from about 0 to 1, said filter device having a band width determined by $\gamma/4=n_1d_1=n_2d_2$ wherein γ is the wavelength of the energy to be transmitted through the filter, n_1 is the refractive index of said first layer, n_2 is the refractive index of said second layer, d_1 is the thickness of said first layer and d_2 is the thickness of said second layer.

5,182,671

VARIABLE MAGNIFICATION OPTICAL SYSTEM HAVING A CAPABILITY OF STABILIZING THE IMAGE

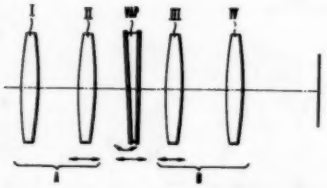
Nozomu Kitagishi, Tokyo, and Shoichi Yamazaki, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1989, Ser. No. 407,657

Claims priority, application Japan, Sep. 19, 1988, 3-234093; May 25, 1989, 1-132189

Int. Cl.[5] G02B *27/64, 15/14*

U.S. Cl. 359—557 **9 Claims**



9. An optical device having an optical axis, comprising:

a front lens group, a zoom lens group located on the image side of said front lens group that is variable in image magnification due to a process of zooming, and a variable angle prism means that is located on the image side of said front lens group;

wherein letting a focal length of the optical device and a distance from a movable surface of said variable angle prism means to an image point of those lens groups positioned on the object side of said variable angle prism means in a first zooming position be denoted by F_0 and S_0, respectively, and a focal length of the optical device and a distance from the movable surface of said variable angle prism means to the image point of those front lens groups positioned on the object side of said variable angle prism means in a second zooming position are denoted by F and S, respectively, wherein, further, if a rear lens group is arranged on the image plane side of said variable angle prism means, image magnifications of said rear lens group in the first and second zooming positions are denoted by β_{B0} and β_B, respectively, and the zoom ratio is denoted by Z and putting the zoom ratio $Z=F/F_0$, the following condition is satisfied:

$$0.7 < \frac{S_0 \cdot \beta_{B0} \cdot Z}{S \cdot \beta_B} < 1.3$$

and wherein if a rear lens group is not arranged, then the values of β_{B0} and β_B become $\beta_{B0}=\beta_B=1$ and the following condition is satisfied:

$$0.7 < \frac{S_0 \cdot Z}{S} < 1.3.$$

5,182,672

FINDER OPTICAL SYSTEM

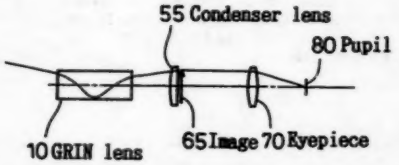
Hiromu Mukai, Kawachinagano, and Yasumasa Sugihara, Sakai, both of Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan

Filed Jul. 16, 1991, Ser. No. 730,546

Claims priority, application Japan, Jul. 17, 1990, 2-189131; Jul. 17, 1990, 2-189132; Jul. 17, 1990, 2-189133

Int. Cl.[5] G01B *3/02*

U.S. Cl. 359—652 **15 Claims**



1. A finder optical system provided separately from a photo-taking lens, comprising from the object side to the image side;

an object lens for forming a primary image which is an inverted image of an object, said object lens comprising a gradient index lens and a constant index lens;

means for erecting the primary image to form an erecting image, and

an eyepiece for enlarging said erecting image, wherein the constant index lens has a negative refractive power and is arranged at the object side of the gradient index lens.

5,182,673

ZOOM LENS HAVING HIGH VARIABLE MAGNIFICATION

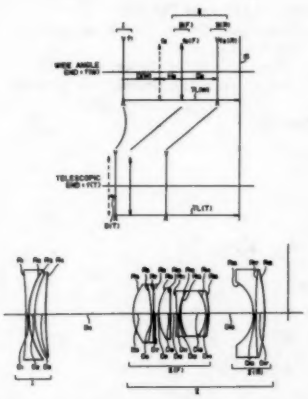
Shuichi Kikuchi, Yokohama, and Masami Itoh, Higashi-Kurume, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 28, 1991, Ser. No. 706,579

Claims priority, application Japan, May 28, 1990, 2-137520; Jun. 14, 1990, 2-156241; Jun. 14, 1990, 2-156242; Jun. 15, 1990, 2-158104; Sep. 13, 1990, 2-243210; Sep. 19, 1990, 2-249288; Oct. 5, 1990, 2-268015; Oct. 11, 1990, 2-272936; Apr. 5, 1991, 3-73229

Int. Cl.[5] G02B *15/177*

U.S. Cl. 359—691 **22 Claims**



1. A zoom lens having a high variable magnification in which first and second lens groups respectively having negative and positive focal lengths are sequentially arranged from an object side of the zoom lens to an image side thereof and a

combined focal length of an entire lens system is changed by changing a distance between the first and second lens groups while the position of an image surface is constantly held,

said zoom lens being constructed such that the second lens group is constructed by front and rear lens groups respectively having positive and negative focal lengths, and the respective focal lengths f_1 and f_2 of the first and second lens groups, the respective focal lengths $f_2(F)$ and $f_2(R)$ of the front and rear lens groups in the second lens group, and combined focal lengths f(W) and f(T) of the entire lens system at wide angle and telescopic ends thereof satisfy the following conditions,

$$[f_1+f_2\cdot\{2-(f_1/f(W))-(f(W)/f_1)\}]/f(T)<0.6 \quad (I)$$

$$[f_1+f_2\cdot\{2-(f_1/f(T))-(f(T)/f_1)\}]/f(T)<0.6 \quad (II)$$

$$0.6<|f_2(R)|/f_2(F)<6.0 \quad (III)$$

$$0.8<f_2(F)/f_2<1.4 \quad (IV)$$

$$0.5<|f_1|/\sqrt{[f(W)\cdot f(T)]}<1.3 \quad (V)$$

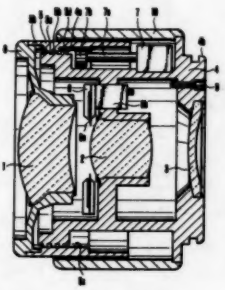
where $\sqrt{[]}$ means a square root of a value within bracket [].

5,182,674

OPTICAL APPARATUS

Hidefumi Notagashira, Kanagawa, and Tsuyoshi Akutsu, Tochigi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1991, Ser. No. 724,701
Claims priority, application Japan, Jul. 9, 1990, 2-182256
Int. Cl.[5] G02B *7/02*
U.S. Cl. 359—694 **27 Claims**



1. An optical apparatus comprising:

a) an optical element; and

b) a moving mechanism having two members arranged to move said optical element in the direction of an optical axis thereof by moving one of said two members in the direction of the optical axis relative to the other while rotating said two members relative to each other, said two members including

b-1) a male helicoid member having a male helicoid screw, and

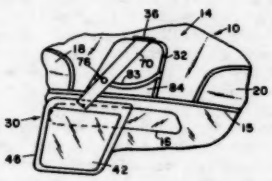
b-2) a female helicoid member having a female helicoid screw arrangement in screw engagement with said male helicoid screw, said female helicoid screw arrangement providing only a single screw thread peripherally interiorly of said female helicoid member along an axis parallel to said optical axis.

5,182,675

PIVOT DOWN ARTICULATED MIRROR

Thomas E. Arbisi, Holland; Ronald A. Dykstra, Grandville, and Gordon J. Stannis, Berkley, all of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Dec. 12, 1991, Ser. No. 806,615
Int. Cl.[5] G02B *7/18*
U.S. Cl. 359—841 **20 Claims**



1. An adjustable mirror assembly for a vehicle comprising:

a mirror housing having a mirror mounted therein;

a pivot arm assembly including a pivot arm having a length substantially as long as said mirror; and

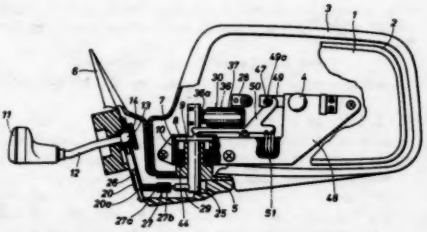
mounting means including a housing, said mounting means pivotally mounting one end of said pivot arm to a vehicle support member and an opposite end to said mirror housing for adjustable movement of said mirror form a stored position to a use position, and guide means coupling said pivot arm to said housing such that said mirror can be translated form side-to-side once lowered to a use position, and adjustably rotated.

5,182,676

TURN-OVER TYPE REARVIEW DOOR MIRROR

Noriyuki Iwai; Kimito Sasaki, both of Saitama; Masaru Yano, Miyazaki; Fumiyoshi Wakimoto, Miyazaki; Wataru Tokunaga, Miyazaki, and Masaru Shirakura, Miyazaki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha and Kabushiki Kaisha Honda Lock, both of, Japan

Continuation of Ser. No. 386,582, Jul. 28, 1989, abandoned. This application May 2, 1991, Ser. No. 697,930
Claims priority, application Japan, Aug. 4, 1988, 63-103771[U]; Aug. 4, 1988, 63-103772[U]; Aug. 4, 1988, 63-103773[U]; Aug. 4, 1988, 63-103774[U]; Aug. 4, 1988, 63-103775[U]; Aug. 12, 1988, 63-107282[U]; Aug. 12, 1988, 63-202097
Int. Cl.[5] G02B *7/18*; B60R *1/06*
U.S. Cl. 359—841 **15 Claims**



1. A turn-over type rearview door mirror for a vehicle, comprising:

a stay member securely attached to a vehicle door and carrying a base member;

a mirror visor pivotally supported by said base member around a vertical retraction pivot axis;

detent means for retaining said mirror visor at a fully extended position and at a fully retracted position;

a rearwardly facing mirror member received in said mirror

visor and pivotally supported so as to be angularly movable around a horizontal axial line and a vertical axial line;

a lateral rod extending through said vehicle door so as to be vertically slidable and rotatable around a vertical pivot axis located at an inner end thereof;

knob means coupled with the inner end of said lateral rod via an actuation linkage mechanism for converting a lateral rotative movement of said knob means around a vertical axial line and a rotative movement of said knob means around another axial line extending substantially perpendicularly to said vehicle door into said rotative movement around said vertical pivot axis and said vertical sliding movement of said lateral rod, respectively;

a vertical driven rod disposed in parallel with said retraction pivot axis and guided so as to be rotatable around and slideable long its central axial line;

a first arm member extending laterally from a lower end of said vertical driven rod, said first arm member having a free end which is pivotally and telescopically coupled with a free end of said lateral rod for converting said vertical sliding movement and said rotative movement of said lateral rod into said sliding movement and said rotative movement of said vertical driven rod, respectively;

a second arm member extending laterally form an upper end of said vertical driven rod;

a connecting rod unit having one end pivotally attached to a free end of said second arm member, and having another end pivotally attached to a reverse surface of said mirror member at an area which is displaced from an intersection of said horizontal axial line and said vertical axial line of said mirror member, such that said sliding movement and said rotative movement of said vertical driven rod is transmitted via said second arm member into angular movement of said mirror member around said horizontal axial line and said vertical axial lie, respectively; and

a clutch unit interposed between a base end of said second arm member and said upper end of said vertical driven rod, comprising a cam part provided at said upper end of said vertical driven rod, a cam follower part provided at said base end of said second arm member for cooperation with said cam part, and a spring member urging said cam follower part toward said cam part so as to elastically follow said second arm member, along with said mirror visor, to be turned around said vertical driven rod against a biasing force of said spring member which tends to restore said second arm member to its neutral position with respect to said vertical driven rod.

5,182,677

EDITING SYSTEM AND METHOD OF EDITING WHEREIN A COMMON SCENE IS RECORDED ASYNCHRONOUSLY DIFFERENT MEDIA

Sojiro Kizu; Yutaka Saito; Ichiro Ninomiya, and Hidehiko Sasho, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

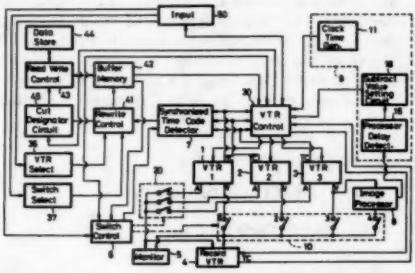
Filed Apr. 24, 1990, Ser. No. 513,688

Claims priority, application Japan, Apr. 27, 1989, 1-108755

Int. Cl.[5] G11B *27/02*

U.S. Cl. 360—14.2 **28 Claims**

1. Apparatus for editing video program information from plural prerecorded source media onto an edit medium, wherein each source medium includes video program information of a common scene which may be recorded on that medium at a location relative to a beginning location thereof that differs from the recording location of that same common scene on another source medium, and each source medium includes address data representing discrete positions thereon, said apparatus comprising: playback means for playing back the program information of said common scene concurrently from the plural source media; monitor means for monitoring the played back program information; indicating means for indicating when a selected location in the common scene is played back substantially simultaneously from the plural source media, storage means for storing as synchronized address data the address data from each source medium representing the actual position at which said selected location is recorded on that source medium; select means for selecting edit points on individual ones of the source media; reference means for referencing the selected edit points to said synchronized address data; and control means for controlling the playback means to play back selected segments of video program information from respective source media for recording onto the edit medium in accordance with the referenced edit points.



5,182,678

PCM SIGNAL REPRODUCING/RECORDING APPARATUS

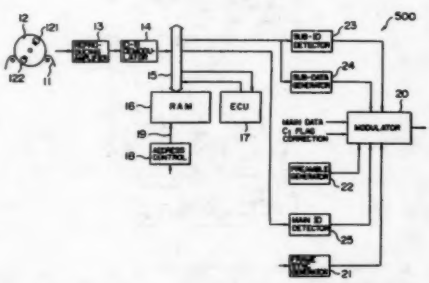
Yuuji Hatanaka; Hiroo Okamoto; Takao Arai, all of Yokohama; Shin-ichi Wakumura, Tokorozawa; Ichiro Miyake, Tokorozawa, and Shunichiro Sakamoto, Kawagoe, all of Japan, assignors to Hitachi Ltd. and Pioneer Electric Corporation, both of Tokyo, Japan

Continuation of Ser. No. 727,856, Jul. 10, 1991, which is a continuation of Ser. No. 231,001, Aug. 11, 1988. This application Feb. 5, 1992, Ser. No. 829,570

Claims priority, application Japan, Aug. 12, 1987, 62-199866; Aug. 20, 1987, 62-205020

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—32 **2 Claims**



1. A PCM signal recording apparatus for recording PCM data on a recording medium in which PCM data and N-blocks of sub-code data are received from a reproducing device which reproduces said PCM data, and said N-blocks of sub-code data prepared by recording N-blocks of identical sub-code data repeatedly N-times in order to add auxiliary information to said PCM data and produces at least N flags indicative of whether said N-blocks of sub-code data are respectively correct, comprising:

reception means for receiving said N-blocks of sub-code data and said N flags;

decision means for deciding whether said N flags received by said reception means indicate whether said N-blocks of sub-code data are respectively correct; and

recording means for recording at least said PCM data and said N-blocks of sub-code data;

said recording means being provided for replacing sub-code data which is decided as being erroneous by said decision means, among said N-blocks or sub-code data received by said reception means, with sub-code data which is decided as being correct by said decision means and for recording sub-code data which is decided as being correct by said decision means repeatedly M-times, where $M \leqq N$ and where M and N are integers.

5,182,679

INFORMATION RECORDING/REPRODUCING METHOD AND MAGNETIC TAPE SUBSYSTEM EMPLOYING THE SAME

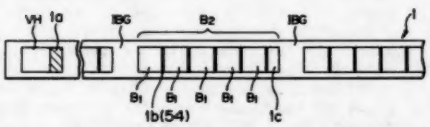
Toshifumi Nishimura, Minamiashigara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 7, 1990, Ser. No. 489,668

Claims priority, application Japan, Mar. 8, 1989, 1-55561

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—48 **16 Claims**



1. An information recording/reproducing method for a magnetic tape, comprising the steps of:

combining a plurality of first data blocks which have been separately transferred from a higher rank apparatus with each other while adding thereto control information for identifying each of said first data blocks;

recording the combined first data blocks with the added control information on the magnetic tape as a continuous second data block;

reading said second data block from the magnetic tape; and

either separating said first data blocks from said second data block based on the control information in said second data block and transferring the separated first data blocks to the higher rank apparatus, or transferring said second data block containing the control information to the higher rank apparatus.

5,182,680

RECORDING CONTROL SYSTEM

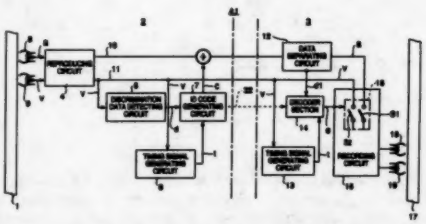
Keitaro Yamashita, and Eiji Ogura, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 22, 1991, Ser. No. 659,568

Claims priority, application Japan, Feb. 26, 1990, 2-45197

Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—60 **9 Claims**



1. A recording control system for preventing undesirable copy of a recorded tape, comprising:

a) means for receiving audio and video information signals from a video tape reproducing apparatus, said audio and video signals being sent to said recording control system by means of a plurality of transmission lines;

b) means for receiving an identification code from said video tape reproducing apparatus, said identification code being sent to said recording control system along a first one of said plurality of transmission lines;

c) means for receiving timing signals from said video tape reproducing apparatus, said timing signals being sent to said recording control system along a second one of said plurality of transmission lines;

d) means for decoding said received identification code with reference to said received timing signals to generate recording control signals;

e) means for recording said received audio and video information signals onto a video tape; and

f) means for controlling an operation of said recording means in response to said recording control signals.

5,182,681

ROTATING HEAD MAGNETIC RECORDING AND REPRODUCING DEVICE HAVING AUTOMATIC TRACKING CONTROL FUNCTION

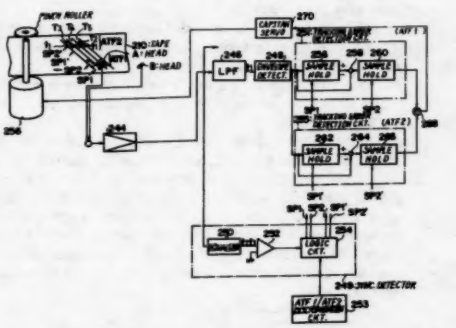
Shohei Yamazaki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 138,659, Dec. 24, 1987, abandoned. This application Apr. 24, 1990, Ser. No. 519,242

Claims priority, application Japan, Dec. 27, 1986, 61-309496; Sep. 2, 1987, 62-219765

Int. Cl.[5] G11B *15/467*

U.S. Cl. 360—70 **8 Claims**



5. A magnetic recording and reproducing device comprising:

a rotary head incorporating a plurality of heads for recording and reproducing an input signal by tracing a magnetic recording medium, said heads also reproducing signals recorded on left and right adjacent tracks simultaneously, and data recorded on said magnetic recording medium including the input signal, a synchronizing signal used for timing control of recording and reproducing of said input signal and a pilot signal of a predetermined frequency used for tracking control, a series of which pilot signals are reproduced alternately by different ones of said plurality of heads; and

tracking control means comprising:

tracking error signal generation means for receiving pilot signals from said plurality of head and generating, at uneven time intervals based on the timing of said synchronizing signal, tracking error signals by detecting crosstalk components of the pilot signals on left and right adjacent tracks and comparing these components with each other;

holding and renewing means for separately holding the tracking error signals generated alternately in response

to the alternately generated pilot signal until next timing of generation of a corresponding tracking error signal and renewing the tracking error signal thus held at said next timing of generation of the corresponding tracking error signal wherein said alternate tracking error signals are renewed separately; and

relative speed control means for combining the tracking error signals held by said holding and renewing means and for controlling a relative speed of said magnetic recording medium with respect to said heads of said rotary head based on said combined tracking error signals.

5,182,682

SECTORED SERVO DISK FORMATTING

Gerald L. Weispfenning, St. Paul, and Lloyd C. Goss, Bloomington, both of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 415,054, Sep. 29, 1989, abandoned. This application Jan. 30, 1992, Ser. No. 829,613

Int. Cl.[5] G11B *5/596, 5/82*

U.S. Cl. 360—77.08 **14 Claims**

6. A sector on a disk containing position information used to determine position error of a transducer over the disk in a data storage system comprising:

a normal field having a length and having a first side and a second side, the first side being oriented opposite the second side on the disk;

a first quadrature field, having a length which is half the length of the normal field, located on the first side of the normal field; and

a second quadrature field, having a length which is half the length of the normal field, located on the second side of the normal field, the normal field and the first and second quadrature fields containing position information and being arranged relative to the normal field to compensate for temporal shifts in position information read from the normal field relative to position information read from the quadrature fields caused by radial velocity of a transducer over the disk.

5,182,683

POSITION CONTROL OF A MAGNETIC HEAD IN A MAGNETIC RECORDING AND REPRODUCING SYSTEM

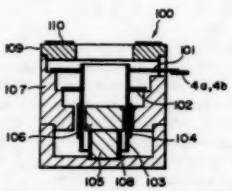
Yasuo Mitsuhashi, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1990, Ser. No. 541,943

Claims priority, application Japan, Jul. 18, 1989, 1-185299

Int. Cl.[5] G11B *5/588*

U.S. Cl. 360—77.16 **10 Claims**



9. A magnetic recording and reproducing system including apparatus for reproducing from a track recorded on a magnetic tape made to travel by being driven by a capstan, said apparatus comprising:

a rotating drum;

a magnetic head provided on said rotating drum in such a manner as to project from an outer peripheral portion thereof by a predetermined amount;

detection means for subjecting a signal read from the track by said magnetic head to envelope detection and converting the signal to a digital envelope signal;

tracking controlling means responsive to the digital envelope signal for controlling the driving by said capstan such that the magnitude of the digital envelope signal output from said detection means becomes substantially maximum;

correction means also responsive to the digital envelope signal for outputting a tracking correction signal such that the intensity of the digital envelope signal output from said detection means becomes maximum; and

magnetic head driving means responsive to the tracking correction signal for causing said magnetic head to be displaced along the rotational axis of said rotating drum on the basis of the tracking correction signal so as to trace the track, said magnetic head driving means further comprising, (a) a yoke, (b) a pair of coaxial annular springs secured to the yoke, one of said annular springs having a projecting portion at one end thereof, said magnetic head being affixed to said projecting portion, (c) an air-core bobbin having an upper portion affixed to a central portion of both said annular springs, (d) a permanent magnet disposed in said air-core bobbin, and (e) an energizing coil wound around an outer periphery of said air-core bobbin and adapted to cause said air-core bobbin to be displaced along the rotational axis of said rotating drum upon being subjected to magnetic interaction between said energizing coil and said permanent magnet by means of the tracking correction signal.

5,182,684

ESTIMATOR POSITIONING SYSTEM AND METHOD

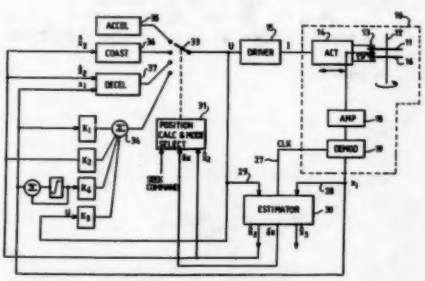
Vincent P. Thomas, Chandlers Ford, and Peter Baker, Lockseath, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/GB89/00231, § 371 Date Nov. 6, 1990, § 102(e) Date Nov. 6, 1990, PCT Pub. No. WO90/10930, PCT Pub. Date Sep. 20, 1990

PCT Filed Mar. 8, 1989, Ser. No. 585,057

Int. Cl.[5] G11B *5/55*

U.S. Cl. 360—78.09 **13 Claims**



1. A method of controlling the movement of a member in a Positioning system to a specified position in a predetermined path along which the member is movable by an actuator in response to actuator control signals, said movement comprising at least acceleration and deceleration phases, the system further including position reference information and transduc-

ing means capable of reading such position reference information to produce a signal indicative of the relative position of the member, the method comprising the steps of

sampling the signals from the position transducing means at regular sampling times;

computing the distance-to-go to the specified position;

estimating the velocity of the member at each sampling time in accordance with a mathematical model of the system and in response to at least the current position signal sample and actuator control signal;

generating, during said deceleration phase of movement, an actuator control signal based on said velocity estimate and distance to go;

applying the generated actuator control signal to the actuator and member is within a predetermined distance of the specified position;

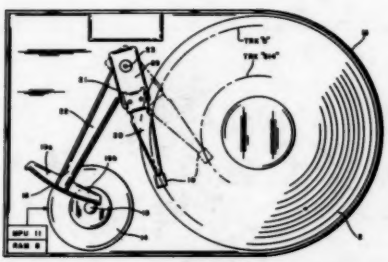
characterized in that the actuator control signal is calculated at each sample time during said deceleration phase of movement as a function of the square of the estimated velocity divided by the distance-to-go.

5,182,685

STEPPER MOTOR TORQUE VARIANCE COMPENSATION USING VARIED APPLIED VOLTAGE

James N. Krause; Brian P. Tremaine, and Litko R. Chan, all of Santa Clara County, Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Feb. 3, 1989, Ser. No. 306,534
Int. Cl.[5] G11B *5/55*
U.S. Cl. 360—78.13 **13 Claims**



1. In a disc drive system comprising at least one constantly rotating disc for storing data on concentric tracks,

means for rotatably supporting said disc,

an actuator for supporting a transducer over said disc for reading and writing digital information on said disc tracks,

positioning means coupled to said actuator for selectively positioning said transducer in alignment with one of said disc tracks as a target track on said rotating disc for reading and writing data,

said positioning means comprising a multi-phase stepper motor for moving said actuator and thereby said transducer from an initial disc track to said target track, and

voltage control means having outputs connected to the phases of said stepper motor, said voltage control means including:

means for deriving and selecting an optimum voltage to be applied to drive transistors associated with energized phases of the motor, the means for deriving and selecting the optimum voltage derives and selects the optimum voltage on command to compensate for aging, temperature and general wear of the disc drive system then existing;

means for applying different voltages to said phases of said stepper motor, measuring a settling time of said motor to each said voltage, and selecting the voltage which provides the shortest settling time as the optimum voltage; and

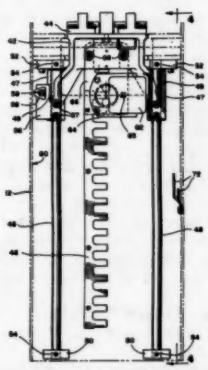
microprocessor means for analyzing the response of said stepper motor to a voltage applied to the phases of said stepper motor, and means responsive to said microprocessor for applying said optimum voltage to the stepper motor phases.

5,182,686

APPARATUS AND METHOD FOR LOADING AND UNLOADING MULTIPLE DIGITAL TAPE CASSETTES UTILIZING A REMOVABLE MAGAZINE

Carl W. Lindenmeyer, St. Charles, Ill., assignor to Universities Research Association, Inc., Washington, D.C.

Filed Apr. 4, 1990, Ser. No. 504,439
Int. Cl.[5] G11B *15/68*; B65D *85/672*
U.S. Cl. 360—92 **8 Claims**



1. An apparatus for loading and unloading one of a plurality of digital tape cassettes into a cassette tape reader for processing, said apparatus comprising:

a. a housing for mounting said reader, said housing having an adapter plate, said adapter plate movable in a direction transverse to said reader;

b. a magazine for storing said cassettes, said magazine comprising a top portion, a bottom portion, two oppositely facing side portions connecting said top and said bottom portions, and a plurality of opposed paris of channel elements substantially evenly spaced extending transversely along oppositely facing surfaces of said side portions and defining a space, said cassettes stored in the space formed between two adjacent channel elements, said magazine and said adapter plate constructed for removable mounting of said magazine to said adapter plate and said magazine removably mounted to said adapter plate, said magazine having at least one pivotable retaining means for preventing said cassettes from accidentally exiting said magazine when said magazine is removed from said adapter plate and for permitting withdrawal of said cassettes form said magazine when said magazine is mounted on said adapter plate;

c. means for driving said adapter plate in a direction transverse to said reader when said magazine is mounted on said adapter plate, said driving means comprising a ladder gear fixedly mounted on said housing and extending in the direction transverse to said reader, and a motor fixedly mounted to said adapter plate, said motor having a distal end and a proximal end and a rotating shaft and a hub mounted on said distal end, said hub having a pair of rollers projecting therefrom at locations to engage the ladder gear at spaced apart locations along the transverse direction when said hub is rotated by said shaft of said motor, thereby translating said adapter plate along said transverse direction;

d. means for detecting when the cassette to be processed by

said reader is positioned for insertion into said reader, said detecting means comprising a first photocell detector operatively associated with said adapter plate and a first indicia affixed to said housing, said first photocell detector detecting said first indicia to identify the position of said adapter plate with respect to the reader, and a second photocell detector operatively associated with said adapter plate and a second indicia affixed to said housing, said second photocell detector detecting said second indicia to identify the position of said adaptor plate with respect to the reader;

e. means for generating a first signal when said position for insertion is detected;

f. insertion means responding to said first signal for inserting said cassette into said reader for processing of information stored on said cassette, said insertion means comprising means for shuttling said cassette from said magazine to said reader when said cassette to be processed by said reader is positioned for insertion into said reader, said shuttle means comprising guide members cooperating with the interior channels of said channel elements of said magazine, whereby said channel elements guide the path of said shuttle means during insertion and removal of said cassettes from said reader, said shuttle means further comprising a shuttle arm pivotally mounted an said housing, said shuttle arm comprising a pair of jaw members pivotally mounted on one end thereof, said jaw members biased normally apart and means for urging said jaw members together to engage said cassette during insertion and removal of said cassette from said reader;

g. means for generating a second signal when the processing by said reader of the information on said cassette is complete;

h. removal means responding to said second signal for removing said cassette from said reader upon completion of processing of the information stored on said cassette, said removal means comprising said shuttle means.

5,182,687

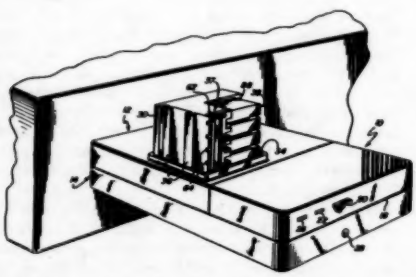
METHOD AND APPARATUS FOR ALIGNING CARTRIDGES WITH A CARTRIDGE INSERTION SLOT

Kenneth C. Campbell, Orange, Calif.; Roger M. Gray, and Barry C. Kockler, both of Lewisville, Tex., assignors to Archive Corporation, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 434,036, Nov. 9, 1989, Pat. No. 5,050,020. This application Apr. 18, 1990, Ser. No. 510,548

Int. Cl.[5] G11B *15/68, 17/22*

U.S. Cl. 360—92 **13 Claims**



1. A method of moving a magazine having a plurality of slots, each of said slots capable of holding a cartridge, to a specific location so that one of said slots is aligned with an acceptor of a tape drive, comprising the steps of:

positioning the magazine in a first position where a first flag is proximate to a flag sensor, said first flag being proximate to said flag sensor indicating that a first one of said slots of said magazine is aligned with the acceptor of the tape drive;

enabling a motor in a first direction to move the magazine from said first position to a second position where a second flag is proximate to the flag sensor, said second flag being proximate to said flag sensor indicating that a second one of said slots of said magazine is aligned with the acceptor of the tape drive;

measuring the amount of time required to move the magazine between said first and second positions;

using the measured amount of time to determine the width of a brake pulse to apply to the motor to stop the magazine with the second flag proximate to the flag sensor so that the second cartridge is aligned with the acceptor of the tape drive; and

applying the brake pulse to the motor.

5,182,688

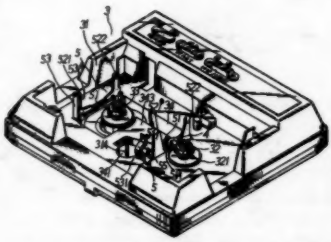
TAPE CASSETTE WINDER AND REWINDER

Tonny Chen, Changhua, Taiwan, assignor to E. Lead Electronic Co., Ltd., Taiwan

Filed Nov. 26, 1990, Ser. No. 617,745

Int. Cl.[5] G11B *5/08*

U.S. Cl. 360—94 **8 Claims**



1. A tape cassette winder and rewinder suitable for selectively operating either a standard VHS or a compact VHS-C tape cassette, said tape winder and rewinder comprising:

a housing;

an upper portion of said housing having a volume corresponding to the volume of a standard VHS tape cassette;

a pair of rotating means in said upper portion of said housing for engaging and driving the reels of a standard VHS type cassette;

a recess in said housing below and communicating with said upper portion;

a pair of pivoting confining members housed within said recess during operation of a standard VHS tape cassette;

a pair of horns and each of said pair of pivoting confining members extending into said upper portion from a base plate in said recess for engagement with a compact VHS-C tape cassette during operation;

a spring returned idle gear assembly rotatably engaged to a reel drive of one of said rotating means and to the pick-up reel of a compact VHS-C tape cassette by return of a spring during operation of the cassette; and

said spring returned idle gear assembly compressed within said recess out of engagement with said reel drive by a standard VHS tape cassette during operation of the cassette.

5,182,689

Patent Not Issued For This Number

5,182,690

FE-N-BASED SOFT MAGNETIC THIN FILMS AND MAGNETIC HEADS USING SUCH FILMS

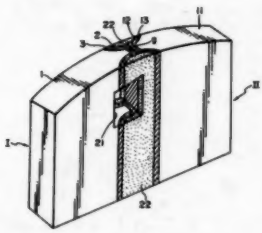
Kenji Katori; Masatoshi Hayakawa; Koichi Aso; Kazuhiko Hayashi, all of Kanagawa, and Kazuo Kajiwara, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 28, 1990, Ser. No. 636,072

Claims priority, application Japan, Dec. 29, 1989, 1-342953; Feb. 27, 1990, 2-46322

Int. Cl.[5] G11B *5/235*

U.S. Cl. 360—120 **8 Claims**



1. A soft magnetic thin film which consists essentially of a composition of the formula,

$$(Fe_aM_b)_{100-c-d}N_cO_d$$

wherein M represents at least one element selected from the group consisting of Si, Al, Ta, B, Mg, Ca, Sr, Ba, Cr, Mn, Zr, Nb, Ti, Mo, V, W, Hf, Ga, Ge and rare earth elements, and a, b, c and d are, respectively, values by atomic % and are defined such that $0.1 \leqq b \leqq 5$, $a+b=100$, $0.5 \leqq c \leqq 15$ and $0.1 \leqq d \leqq 13$.

5,182,691

MAGNETIC HEAD CLEANING SYSTEM FOR ROTARY HEAD DEVICES

Kazuo Mimasu, Yaita; Katsuhiko Watanabe, and Nobutoshi Suzuki, both of Utsunomiya, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 7, 1991, Ser. No. 666,052

Claims priority, application Japan, Oct. 26, 1990, 2-289208

Int. Cl.[5] G11B *5/10*

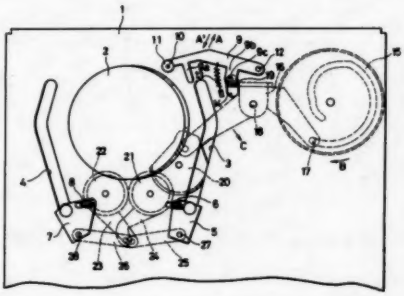
U.S. Cl. 360—128 **15 Claims**

1. A magnetic head cleaning system for cleaning a magnetic head provided inside a rotary drum installed on a chassis while a tape is being guided thereto, comprising:

a cleaning device including:

a cleaning lever capable of pivoting freely and supported by a pivot secured to the chassis; cleaning means installed at an end of the cleaning lever located toward the rotary drum; a resilient member for urging the cleaning lever to permit the cleaning means to come into contact with the rotary drum; and means for pivoting the cleaning lever, the cleaning means cleaning the magnetic head by coming into contact with the rotary drum; and

tape guiding means including at least one movable tape guiding member for guiding the tape, and a drive member capable of pivoting freely about a pivot which is secured to the chassis and supports the drive member, the drive member being operatively connected to the at least one movable tape guiding member,



the drive member being adapted to permit the cleaning means to be separated from the rotary drum by coming into contact with the means for pivoting.

9. A cleaning method for a magnetic head provided inside a rotary drum installed on a chassis comprising the steps of:

maintaining a cleaning member separate from the rotary drum by the pressing a pin provided on a first portion of a cleaning lever having the cleaning member with a drive member connected to a tape guiding member and by allowing the cleaning lever to pivot;

shifting the tape guiding member in cooperation with the drive member;

causing the cleaning member to come into contact with the rotary drum by the relaxation of the pressing force on the pin by the drive member and by the pivoting of the cleaning lever due to a resilient member; and

separating the cleaning member from the rotary drum by causing the tape guiding member to come into contact with a second portion of said cleaning lever and free of a pressing force by said drive member on the pin.

5,182,692

Patent Not Issued For This Number

5,182,693

MAGNETIC DISK

Keiji Koga; Jun-ichi Satoh, both of Saku; Kenji Yokoyama, Komoro; Akinori Nisizawa, and Yasumichi Tokuoka, both of Saku, all of Japan, assignors to TDK Corporation, Tokyo, Japan

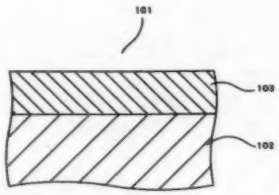
Continuation of Ser. No. 635,211, Dec. 28, 1990, abandoned. This application May 8, 1992, Ser. No. 883,250

Claims priority, application Japan, Dec. 29, 1989, 1-342990; Sep. 4, 1990, 2-233590

Int. Cl.[5] G11B *5/706*

U.S. Cl. 360—135 **3 Claims**

1. A magnetic disk comprising a rigid substrate and a magnetic layer formed thereon by coating a magnetic coating composition containing magnetic submicron particles, wherein



the substrate has a surface roughness Ra of up to 0.007 μm, and

the magnetic layer has a thickness of up to 0.5 μm, a surface roughness Ra of up to 0.005 μm, and a porosity of 4 to 45%.

5,182,694

CORONA DISCHARGING APPARATUS WITH AUTOMATIC CLEANING MECHANISM FOR CORONA WIRE

Michiaki Endo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1990, Ser. No. 591,266

Claims priority, application Japan, Sep. 29, 1989, 1-252438

Int. Cl.[5] G03G *21/00*

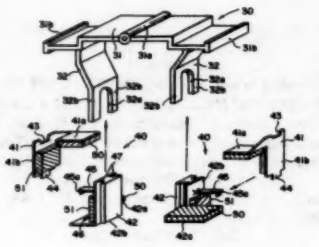
U.S. Cl. 361—229 **28 Claims**

18. A corona discharging apparatus, comprising:

a corona discharge wire;

a support portion for spanning and supporting said corona discharge wire; and

cleaning means contacting said corona discharge wire in the spanning direction of said corona discharge wire for cleaning said corona discharge wire, said cleaning means having a cleaning member comprising four cleaning surfaces, each cleaning surface being engageable with said wire and extending along the length of said wire and each of said four cleaning surfaces being offset at substantially right angles, when viewed in a cross section of said corona discharge wire.



5,182,695

CERAMIC COMPOSITION AND ELECTRONIC PART USING THE SAME

Kiyoji Handa; Satoshi Mukaeda, both of Nagai; Hideyuki Kanai, Kawasaki; Yohachi Yamashita, Kawasaki; Osamu Furukawa, Kawasaki, and Mitsuo Harata, Kawasaki, all of Japan, assignors to Marcon Electronics Co., Ltde., Nagai and Kabushiki Kaisha Toshiba, Kawasaki, both of, Japan

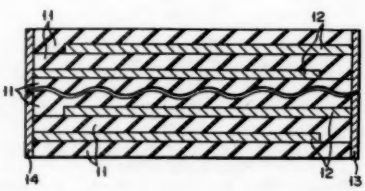
PCT No. PCT/JP90/01669, § 371 Date Jul. 23, 1991, § 102(e) Date Jul. 23, 1991, PCT Pub. No. WO91/09814, PCT Pub. Date Jul. 11, 1991

PCT Filed Dec. 21, 1990, Ser. No. 743,361

Claims priority, application Japan, Dec. 22, 1989, 1-331054

Int. Cl.[5] H01G *4/12*

U.S. Cl. 361—321 **6 Claims**



1. A dielectric ceramic composition comprising oxides of Pb, A, B_1 and B_2 in amounts sufficient to provide, when sintered, a dielectric of a crystal structure represented by general formula:

$$(Pb_{1-x}A_x)_a[(B_1)_{1-y}(B_2)_y]_bO_3 \quad (I)$$

where A is at least one element selected from the group consisting of Ca, Sr, Ba, Ag, La and Nd, B_1 is at least one element selected from the group consisting of Mg, Zn, Ni, Co, Fe, Mn and In, B_2 is at least one element selected from the group consisting of Nb, W, Ta and Sb, x is more than 0 to 0.5, y is $\frac{1}{3}$ when B_2 is W, or $\frac{1}{2}$ when B_2 is Nb, Ta or Sb, a represents the total number of mols of the elements constituting A-site comprising Pb_{1-x} and A_x, and b represents the total number of mols of the element constituting B-site comprising B_1 and B_2, and the ratio a/b is from 0.95 to 0.99.

5,182,696

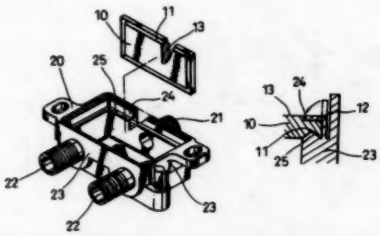
DISTRIBUTOR FOR TELEVISION SETS

Jern-Shong Her, No. 44, Lane 8, Chang Mei Road Sec. 1, Changhua City, Taiwan

Filed Jun. 8, 1992, Ser. No. 895,042

Int. Cl.[5] H02B *1/00*

U.S. Cl. 361—380 **1 Claim**



1. A distributor for television sets comprising a substantially rectangular container and a substantially rectangular cover corresponding to said container;

said container having an input connecting means for connecting an antenna cable thereto provided at one of its side walls and two output connecting means for connecting wires to TV sets thereto provided at another side wall opposite to said one side wall on which said input connecting means is provided;

said side walls of said container including four outer walls, a circle of thinner walls which is formed just inside and around said four outer walls to constitute a substantially rectangular upward projected frame, and a lower flange with steepled top formed just inside and around said thinner walls near the root of said thinner walls;

said cover having reversed V-shaped grooves formed around and adjacent to bottom inner edges of said cover, four chamfered top edges, and a raised top portion which is smaller in area than said cover and has a thickness the same as that of said thinner walls of said container;

said reversed V-shaped grooves fitting onto said steepled top when said cover is positioned on said container; and

said thinner walls pressed and bent inward to seal the entire periphery of said cover after said cover is positioned on said container, and said bent thinner walls being flush with the top surface of said raised top portion of said cover.

5,182,697

COMPUTER WITH DETACHABLE PRINTER MOUNTING HARDWARE

Tasi I-Shou, 13F, No. 409, Sec. 2, Jenai Rd., Taipei, Taiwan

Filed Jan. 14, 1992, Ser. No. 820,231

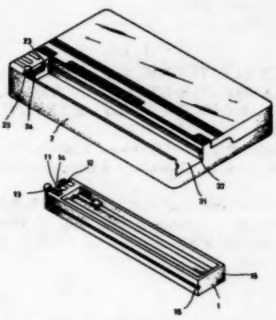
Int. Cl.[5] H05K *7/10*; G06F *1/00*

U.S. Cl. 361—393 **1 Claim**

1. A detachable printer mounting hardware comprising:

a computer mainframe having an elongated recess longitudinally disposed on a top edge thereof at one side, said elongated recess including an opening at one end and a vertical stop wall at an opposite end, two parallel rails bilaterally disposed inside said elongated recess, a plurality of retaining holes and a printer-terminal connector on said vertical stop wall; and

a printer housing detachably inserted through said opening into said elongated recess, said printer housing having a



set of I/O pins connected to said printer-terminal connector, a set of hooks respectively hooked in said retaining holes, a power switch on a top edge thereof, and two sliding grooves on two opposite side walls thereof movably engaged with said two parallel rails.

5,182,698

FUNCTION EXPANDING APPARATUS FOR COMPACT ELECTRONIC DEVICE

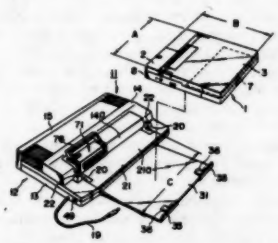
Takaichi Kobayashi, Itsukaichi; Kazuka Shibasaki, both of Hamura; Takashi Hosoi; Masami Honda, both of Oome, and Kazuyoshi Takahashi, Tama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Kei Corporation, Tokyo, both of, Japan

Filed Dec. 14, 1990, Ser. No. 627,738

Claims priority, application Japan, Dec. 15, 1989, 1-144810[U]; Feb. 12, 1990, 2-31207; Apr. 13, 1990, 2-98441; Nov. 29, 1990, 2-333055

Int. Cl.[5] H05K *1/14*

U.S. Cl. 361—395 **24 Claims**



1. An apparatus for expanding function of an electronic device, said electronic device including a rear portion having a connector thereon and a front portion having a front edge portion opposing the rear portion, said apparatus comprising:

a casing containing therein an expanding device for function expression, said casing having a supporting portion for bearing the rear portion of the electronic device while the front portion of the electronic device extends in a predetermined direction from the casing;

an apparatus-side connector providing at the casing, connected electrically to the expanding device, and removably connected to the connector of the electronic device set on the supporting portion; and

means for holding the electronic device on the supporting portion while the connector of the electronic device is connected to the apparatus-side connector, said holding

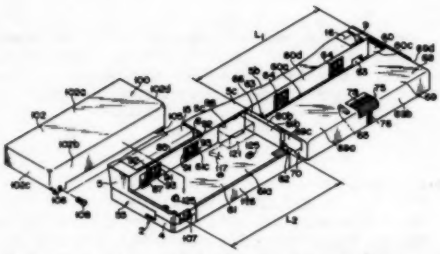
means including a retaining portion for engaging the front edge portion of the electronic device on the supporting portion to restrain the movement of the electronic device in said predetermined direction, said retaining portion being connected to the casing to be moveable in said predetermined direction.

5,182,699

PORTABLE ELECTRONIC APPARATUS HAVING AN INTERCHANGEABLE DETACHABLE BATTERY AND OPTIONAL COMPONENT FOR EXPANDING A FUNCTION

Takaichi Kobayashi, and Mitsuhiro Yoshida, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 21, 1991, Ser. No. 717,609
Claims priority, application Japan, Jun. 25, 1990, 2-166219
Int. Cl.[5] H05K *5/02, 7/10;* **G06F** *1/16*
U.S. Cl. 361—395 **7 Claims**



1. A portable electronic apparatus receiving at least one of first and second batteries, said apparatus comprising:

an optional component having a first connector disposed therein;

a base unit having a first mounting recess therein disposed to receive said first battery and a second mounting recess therein disposed to selectably receive one of said second battery and said optional component, said optional component replacing said second battery in said second recess when said optional component is positioned in said second recess, said second mounting recess comprising at least one contact piece extending therefrom for contacting said second battery when said second battery is positioned therein and a front surface having a connector insertion hole therein, said connector insertion hole being disposed away from said at least one contact piece;

a second connector disposed in said base unit, said first connector opposing said connector insertion hole when said optional component is positioned in said second mounting recess; and

an adapter unit, detachably coupled to said first connector and projecting from said optional component, said adapter unit inserting into said connector insertion hole and coupling to said second connector when said optional component is positioned in said second mounting recess.

5,182,700

METHOD AND APPARATUS FOR CONNECTING A DEVICE TO A PRINTED CIRCUIT BOARD

Charles M. Weimer, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 22, 1991, Ser. No. 733,490
Int. Cl.[5] H05K *7/02*
U.S. Cl. 361—400 **24 Claims**

13. A process for connecting an electrically operable device to a printed circuit board comprising the steps of:

a. providing a printed circuit board having at least one aperture formed therein;

b. providing an electrically operable device including a housing having at least one electrical terminal extending therefrom;

c. providing a fastener made of a molded plastic material capable of withstanding a soldering environment;

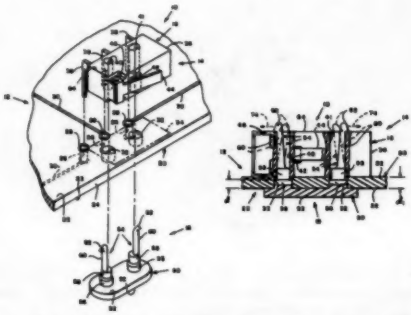
d. mounting the device on the board such that each of the at least one terminals thereof extends through a different one of the at least one board apertures;

e. connecting the device to the board by means of the fastener; and

f. wave-soldering the terminals to the printed circuit board after the connecting step;

g. wherein step (a) includes the step of providing at least one opening in the board, step (b) includes the step of providing at least one opening in the housing, and step (e) includes the step of inserting the fastener into each of the at least one openings.

19. Apparatus comprising:



a. a printed circuit board having at least one aperture formed therein;

b. an electrically operable device including a housing having at least one electrical terminal extending therefrom, the device mounted on the board such that each of the at least one terminals thereof extends through a different one of the at least one board apertures, the terminals soldered to the board; and

c. a fastener for connecting the device to the board before the at least one housing terminal is soldered thereto, and the fastener made of a molded plastic material capable of withstanding a soldering environment;

d. wherein the board includes at least one opening formed therein, the housing includes at least one opening formed therein, and the fastener is inserted into each of the at least one openings.

5,182,701

THREE-PHASE PWM INVERTER PROVIDING AN IMPROVED OUTPUT SINUSOIDAL WAVEFORM

Hiroshi Mochikawa; Tatsuya Hirose, both of Yokkaichi, and Taki Horiguchi, Higashi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 19, 1991, Ser. No. 732,837
Claims priority, application Japan, Jul. 20, 1990, 2-190467; Jul. 20, 1990, 2-190468
Int. Cl.[5] H02M *7/5387*
U.S. Cl. 363—98 **9 Claims**

1. In an inverter device comprising:

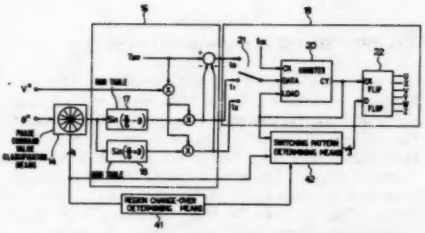
an inverter main circuit including six bridge-connected switching elements which can be turned on and off in predetermined patterns so that a dc voltage supplied from an external source is converted to a three-phase ac approximately sinusoidal voltage and

a three-phase PWM signal generating device connected to the inverter main circuit for generating switching pattern signals for turning on and off the switching elements in

order to provide six kinds of switching patterns corresponding to six fundamental voltage vectors out of phase from one another by an electrical angle of $2\pi/6$, respectively, and switching patterns corresponding to a zero vector corresponding to an "on" or "off" state of substantially all the switching elements so that the inverter main circuit generates an approximately sinusoidal output voltage waveform, the three-phase PWM signal generating device comprising

phase command value classification means for classifying a phase command value θ^*, pertaining to a voltage command value V^*, into one of a plurality of unit regions, calculating a lead angle in the one unit region into which the phase command value is classified, and generating corresponding output information representative of the result of the classification and the lead angle, wherein the phase command value classification means obtains the plurality of unit regions by dividing an electrical angle of 2π into a plurality of equal regions,

switching pattern determining means supplied with the output information of the phase command value classification means for setting the switching patterns corresponding to two kinds of fundamental voltage vectors corresponding to the one unit regions to which the



phase command value is classified and the zero vector, the fundamental voltage vectors being out of phase from each other by an electrical angle of $\pi/3$, the switching pattern determining means further setting an output sequence of the set switching patterns, the switching pattern determining means inserting the switching pattern corresponding to the zero vector into each of the two kinds of switching patterns once during formation of each of the two kinds of switching patterns,

holding time calculating means supplied with the output information of the phase command value classification means for calculating a holding time of each of the switching patterns corresponding to the two kinds of fundamental voltage vectors and the zero vector, based on the lead angle of the phase command value θ^* belonging to the one unit region and the supplied voltage command value V^*, and generating signals representative of the calculated holding times, and

timing means supplied with the signals representative of the calculated holding times and connected to the switching pattern determining means for holding a formation state of each set switching pattern calculated by the holding time calculating means.

5,182,702

INVERTER DEVICE

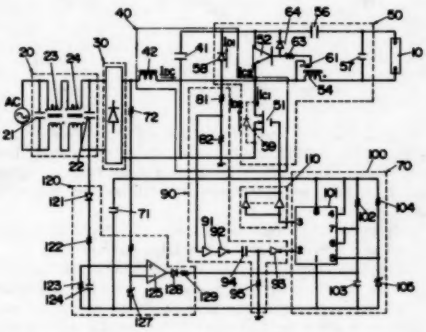
Akinori Hiramatsu, Ikoma; Futoshi Okamoto, Hirakata; Hiroshi Kido; Hiroyuki Sako, both of Moriguchi; Yukio Yamanaka, Kadoma, and Koji Yamada, Sakai, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Dec. 24, 1990, Ser. No. 633,612

Claims priority, application Japan, Dec. 25, 1989, 1-335332; Dec. 25, 1989, 1-335334; Dec. 25, 1989, 1-335336; Mar. 27, 1990, 2-77802; Sep. 25, 1990, 2-256181

Int. Cl.[5] H02M *7/537*

U.S. Cl. 363—132 **16 Claims**



1. In an inverter device for providing a high frequency alternating voltage to a load, which comprises:

a full-wave rectifier to provide a pulsating DC voltage from an input AC voltage;

a smoothing circuit for receiving the rectifier output to provide a smoothed DC voltage, said smoothing circuit comprising a smoothing capacitor, choke coil means, and a switching element which operates to flow through said choke coil means current from said full-wave rectifier so as to supply the same with electromagnetic energy when it is turned on and release said electromagnetic energy into said smoothing capacitor when it is turned off to thereby accumulate said smoothed DC voltage across said smoothing capacitor;

an inverter including the switching element which is common to said smoothing circuit for switching the smoothed DC voltage accumulated at said smoothing capacitor at a high frequency to apply a resulting voltage to a load circuit, said load circuit including said load, inductance and capacitor means to define an oscillation circuit which provides to said load an oscillating current composed of first and second currents flowing through said load in opposite directions to each other for effecting an inverter operation, said first and second currents alternating to flow for a nominal on-time duration determined by a circuit constant of said oscillation circuit itself; an improvement characterized in that said inverter device further comprises:

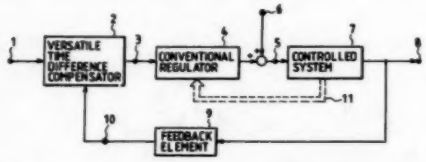
a controller having detector means for detecting termination of said second current and exciting said common switching element at a timing dependent upon said termination of said second current so as to begin flowing said first current; and

said controller having timer means for separately controlling an actual on-time duration for flowing said first current within said nominal on-time duration following the said nominal on-time duration of said second current, while leaving said second current to flow for a fixed time interval of said nominal on-time duration.

5,182,703
METHOD AND APPARATUS OF TWO-DEGREES-OF-FREEDOM TIME DIFFERENCE COMPARISON COMPENSATOR

Nobuo Yamamoto, 2917-111 Mawatari, Katsuta-shi, Ibaraki 312, Japan

Filed Jul. 17, 1990, Ser. No. 553,377
Claims priority, application Japan, Jul. 22, 1989, 1-190263
Int. Cl.[5] G05B *13/00*
U.S. Cl. 364—148 **8 Claims**



1. In a control system using a controller or a regulator for executing the stabilization of perturbations and the regulation of responses to a desired value or a reference value, an apparatus of two-degrees-of-freedom time difference comparison compensator, comprising:

a versatile time difference compensator disposed upstream of said controller or said regulator and including

(a) means for branching said desired value or said reference value into a primary branch and an n-number of branches (wherein n designates a positive integer except for one);

(b) means for comparing said primary branch directly with a feedback variable to obtained a primary difference value;

(c) means for transmitting said n-number of branches of said reference value into lag elements having various delay times;

(d) means for comparing the outputs of the respective said lag elements with said feedback variable respectively to obtain an n-number of difference values;

(e) means for transmitting said primary difference value and said n-number of difference values into various weighting elements to multiply said primary difference value and said n-number of difference values by various weights thereby to obtain weighted signals;

(f) means for calculating the sum of said weighted signals to obtain a sum signal; and

(g) means for transmitting said sum signal into a gain adjustment element to re-adjust a gain for said sum signal to be outputted to said controller or said regulator thereby to produce an operation value; and

means for producing said feedback variable from a controlled variable controlled by said controller or said regulator and feeding back said feedback variable to said versatile time difference compensator.

5,182,704
METHOD AND DEVICE FOR REGULATING THE SPRAYING OF COATING MATERIALS

Bengt-Göran Bengtsson, Angered, Sweden, assignor to Advanced Flow Control AFC Aktiebolag, Sweden

PCT No. PCT/SE89/00271, § 371 Date Dec. 24, 1990, § 102(e) Date Dec. 24, 1990, PCT Pub. No. WO89/11340, PCT Pub. Date Nov. 30, 1989
PCT Filed May 18, 1989, Ser. No. 603,703
Claims priority, application Sweden, May 18, 1988, 8801847
Int. Cl.[5] G05B *13/02*; B05B *12/14*
U.S. Cl. 364—148 **17 Claims**

1. Method for regulating the spraying of coating material including the steps:

feeding coating material by means of a pump (1) to a spray device (2);

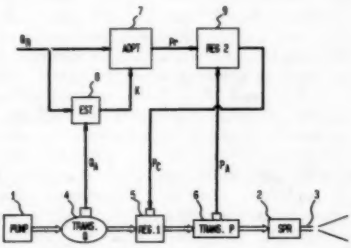
setting a set-point flow value to form a set-point flow signal (Q_R) corresponding to a desired rate of flow at which one wishes the coating material to be sprayed by the spray device;

measurement of the true rate of flow of the coating material to form a true flow signal (Q_A);

characterized by including the steps:

generating an estimated co-efficient signal (K) in an estimator (8) in accordance with the set-point flow signal (Q_R) and the true flow signal (Q_A);

generating a set-point pressure signal (P_R) in accordance



with the set-point flow signal (Q_R) and the estimated co-efficient signal (K);

measuring the pressure of the coating material for forming a true pressure signal (P_A);

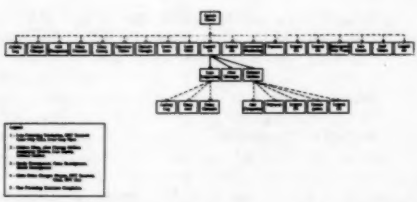
generation of a control pressure signal (P_C) in accordance with the point pressure signal (P_R) by means of a pressure regulation device (9); and

varying by means of an actuator (5) the pressure of the coating material in accordance with the control pressure signal (P_C).

5,182,705
COMPUTER SYSTEM AND METHOD FOR WORK MANAGEMENT

Robin Barr, Avon, Conn.; Linda Beauchesne, Santa Cruz, Calif.; Ronald Benson, Bristol, Conn.; Maureen Burdick, Burlington, Conn.; Joan Duffy, Simsbury, Conn.; Paul Fletcher, Hartford, Conn.; Denise Fritz, West Simsbury, Conn.; John R. Gaddas, West Hartford, Conn.; Joseph Girardini, Ellington, Conn.; Robert Guilmette, Bloomfield, Conn.; David Hughes, Plymouth, Conn.; Joseph Long, W. Hartford, Conn.; Lymon Maytubby, Winsor, Conn.; Beverly Montresor, West Hartford, Conn.; Susan Moore, Unionville, Conn.; Teresa Patch, Amsterdam, Netherlands; Russell Pollnow, Manchester, Conn.; Gary Prignon, Plainville, Conn.; Anthony Retartha, Burlington, Conn.; Mary Jo Round, South Windsor, Conn., and Christopher Machnich, Glastonbury, Conn., assignors to ITT Corporation, New York, N.Y.

Filed Aug. 11, 1989, Ser. No. 392,842
Int. Cl.[5] G06F *15/22, 15/24*
U.S. Cl. 364—401 **22 Claims**



1. A work management system comprising: processing means, including a data bank into which data is written and from which data is read, said data bank storing information regarding an initial transaction, work source information,

office staff information, policy information, information regarding dates of importance, in formation regarding work processing activities, staff case load information, and predetermined text data for preparing documents, the data bank including staff table means for storing, retrieving, displaying and modifying information about staff members who access the system, wherein said stored information includes: name, user ID, job title, supervisor, experience level, cost rate, diary rollover limit, scheduled vacation, payment authority, and staff functional and processing authority levels; at least one terminal means for communicating with said processing means and operable by at least one operator to produce requests and to enter information and/or retrieve information for writing and/or reading from said data bank; display means for displaying information that is entered and retrieved; first merging means operatively interacting with said processing means for reading out from said data bank selected information regarding work processing activities and selected office staff information and merging said read out work processing activities information and said read out office staff information to compile an activity log listing key work activities and a staff member associated with those activities; case summary means for automatically summarizing said initial transaction information; routing means for routing transaction information to a staff member for processing in response to input through one of said terminal means; and staff member electronic mailbox means for receiving said initial transaction summary and other electronic messages; assignment means for assigning a case to a particular staff member for processing in response to input through one of said terminal means; reassignment means for reassigning cases from a particular staff member to another staff member for processing, diary means for automatically and manually setting, storing and displaying dates for various activities associated with the processing of a case including means for manually overriding automatically set diary dates; activity log means for automatically recording information about transactions undertaken through the system in the processing of a case and for manually recording information and comments about other activities in the processing of a case including means for selectively displaying said recorded information and comments on said display means; inquiry means for selectively retrieving and displaying transaction information in response to input of at least one case number through one of said terminal means; system controller means for controlling an operator's movements within the system, wherein said system controller means verifies the availability of each requested function during a system session and verifies said operator's authority to access a system function prior to permitting such access; and security means comprising security level means for selectively limiting access to certain predetermined functions of the system in accordance with a preset security level associated with each authorization code.

5,182,706

BUFFER STATION FOR DOCUMENT PROCESSING AND BALANCING FACILITATION

Brian Cunningham, Clarksville, and Frank Hanou, Silver Spring, both of Md., assignors to Computer Entry Systems Corporation, Silver Spring, Md.

Continuation of Ser. No. 361,765, May 30, 1989, abandoned, which is a continuation of Ser. No. 74,035, Jul. 16, 1987, abandoned. This application Dec. 6, 1989, Ser. No. 445,162

Int. Cl.[5] G06F *15/30*

U.S. Cl. 364—406 **12 Claims**

1. An improved single station paper document transport system for verifying a balancing between the amount obtained from at least one remittance document associated with a transaction document and a transaction amount obtained from said transaction document, comprising:

means for feeding said transaction document and each of said at least one remittance document one at a time through a transport means;

means for detecting data contained on at least said transaction document wherein said data is in the form of at least one of optically and magnetically recognizable characters;

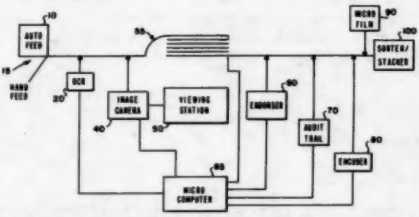
means for storing said detecting data as said transaction amount;

operator control means for inputting data indicating the amount of each of said at least one remittance document;

means for indicating the achievement of a balance between said transaction amount and the total of said input data indicating the amount of each of said at least one remittance document;

means for storing in succession said transaction document and each of said at least one remittance document fed one at a time through said transport means;

means for releasing, one at a time all of said transaction and



remittance documents from said document storage means in response to an output of said means for indicating a balance;

means for processing said documents released from said document storage means wherein said processing means includes means for encoding each of said at least one remittance document with an amount equal to said amount from said each remittance document whereby said documents in said document storage means are not released from said document storage means and are not processed until all of said remittance and transaction documents have been stored in said document storage means and until after a balance has been obtained between said total of said input data and said transaction amount detected from said transaction document.

5,182,707

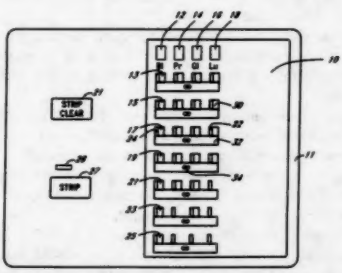
APPARATUS FOR RECORDING REAGENT TEST STRIP DATA BY COMPARISON TO COLOR LIGHTS ON A REFERENCE PANEL

Tommy G. Cooper, Friendswood; Ross E. Smith, Houston, and Emil S. Macha, Sugarland, all of Tex., assignors to Healthdyne, Inc., Marietta, Ga.

Filed Jul. 23, 1990, Ser. No. 558,062

Int. Cl.[5] G06F *15/00, 15/42*

U.S. Cl. 364—413.11 **44 Claims**



1. Apparatus for recording the analysis of a reagent strip having a plurality of color blocks for testing a plurality of different parameters, said apparatus comprising

a panel member including a color chart area comprising a plurality of color groups corresponding to different color blocks of a developed reagent strip, and including two or more set of a plurality of visually distinguishable color spots, each set for testing one of said plurality of different parameters; a plurality of first lights each for signaling the testing of one of said plurality of different parameters; a plurality of second lights each located adjacent a different one of said color spots; and a space adjacent each group of said color spots for positioning said reagent strip and detection means cooperating therewith for detecting said reagent strip in said space;

a microcomputer having means for recording test results for each of said plurality of different parameters, means for directing sequential testing of said plurality of different parameters, and light energizing means for turning said lights on and off during said sequential testing; and

means for recording and storing selected color spots.

5,182,708

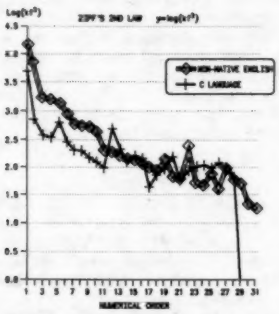
METHOD AND APPARATUS FOR CLASSIFYING TEXT

Koichi Ejiri, Santa Clara, Calif., assignor to Ricoh Corporation, Menlo Park, Calif. and Ricoh Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 626,642, Dec. 11, 1990, abandoned. This application Sep. 24, 1991, Ser. No. 764,790

Int. Cl.[5] G06F *15/38*

U.S. Cl. 364—419 **11 Claims**



1. A text classification method for use in a text classification system having first, second, and third counts, the method comprising the steps of

isolating incoming text by separating the incoming text into incoming words,

incrementing said first count for each incoming word,

comparing each incoming word with a first stored word list to determine if the incoming word matches with a stored word,

adding the incoming word to the first stored list if there is no match and incrementing said second count,

comparing each incoming word with a second stored word list to determine if the incoming word matches with a stored word and if there is no match, adding the incoming word to the second stored word list,

incrementing said third count,

determining a first constant by a ratio of said first count to said second count and determining a second constant by a ratio of said third count to said first count, and

determining the text classification by the value of said first and second constants.

5,182,709

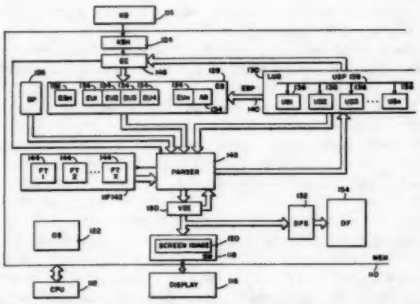
SYSTEM FOR PARSING MULTIDIMENSIONAL AND MULTIDIRECTIONAL TEXT INTO ENCODED UNITS AND STORING EACH ENCODED UNIT AS A SEPARATE DATA STRUCTURE

Peter M. Makus, Methuen, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 208,815, Jun. 16, 1988, abandoned, which is a continuation of Ser. No. 879,729, Jun. 27, 1986, abandoned, which is a continuation-in-part of Ser. No. 846,667, Mar. 31, 1986, abandoned. This application Feb. 28, 1990, Ser. No. 488,528

Int. Cl.[5] G06F *3/023, 3/14*

U.S. Cl. 364—419 **35 Claims**



1. In an information processing system including a keyboard, a display device, and an editing means, coupled to said keyboard and said display device, for editing both multidirectional and multidimensional text, the editing means comprising:

memory means storing instructions for editing text, said text including said multidirectional and multidimensional text;

input receiving means responsive to keystrokes from said keyboard representing text characters and editing commands for generating a string of codes defining a text;

parser means responsive to said string of codes from the input receiving means and said instructions in said memory means for:

reading the codes of the string and parsing the codes into encoded units, each of said encoded units being stored in said memory means as a data structure, each said encoded unit defining a different group of one or more characters and at least one of said encoder units defining a group of two or more characters that are positioned in an expression as a unit, said unit being delineated by predefined characters, and being comprised of codes which define the group, and

generating for each said encoded unit a unit structure and storing said unit structure in said memory means, wherein each said unit structure is comprised of a data structure that contains information defining a visual representation of the corresponding encoded unit, said visual representation being such that said multidirectional text and said multidimensional text are represented for visual display; and

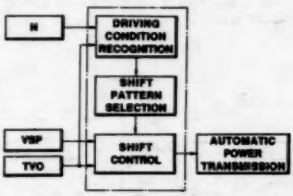
display means for receiving and displaying said visual representation information from said memory means on said display device.

5,182,710

DRIVING CONDITION RECOGNITION SYSTEM FOR AN AUTOMOTIVE VEHICLE AND SHIFT CONTROL SYSTEM FOR AN AUTOMOTIVE AUTOMATIC POWER TRANSMISSION UTILIZING THE RESULTS OF VEHICULAR DRIVING STATE RECOGNITION

Naoki Tomisawa, Isezaki, Japan, assignor to Japan Electronic Control Systems Co. Ltd., Gunma, Japan

Filed Apr. 4, 1990, Ser. No. 504,183
Claims priority, application Japan, Apr. 4, 1989, 1-83901
Int. Cl.[5] B60K *41/18*
U.S. Cl. 364—424.1 21 Claims



1. A system for controlling shifting of an automotive automatic power transmission comprising:

a vehicle speed sensor for monitoring a vehicle speed for producing a vehicle speed data;

a throttle angle sensor for monitoring a throttle valve angular position for producing a throttle angle data;

a shift pattern selection means for selecting one of a plurality of transmission speed ratio shifting pattern respectively adapted to vehicular driving modes, said shift pattern selection means being associated with a driving condition recognizing means which includes:

first means for monitoring a plurality of preselected parameters reflecting a vehicle driving condition and sampling parameter data of respective parameters with a given intervals;

second means for processing sampled parameter data of each parameter for deriving a parameter associated evaluation data of the corresponding parameter;

third means utilizing a plurality of evaluating functions respectively set with respect to the corresponding parameter, for deriving distribution of said parameter associated evaluation data over a plurality of predetermined value ranges respectively corresponding a plurality of vehicular driving modes to produce a distribution indicative data; and

fourth means for processing the distribution indicative data of all parameters for deriving a vehicle driving condition indicative data; and

a shift control means for deriving a transmission speed ratio on the basis of said vehicle speed data and said throttle angle data according to selected one of the shift patterns.

5,182,711

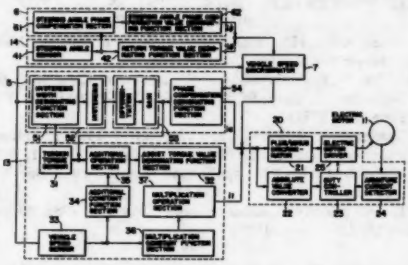
MOTOR CONTROL SYSTEM FOR ELECTRIC POWER STEERING APPARATUS

Tsutomu Takahashi; Saiichiro Oshita, and Toyohiko Mouri, all of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 378,125, Jul. 11, 1989, abandoned. This application Feb. 5, 1991, Ser. No. 651,058
Claims priority, application Japan, Jul. 19, 1988, 63-180631
Int. Cl.[5] B62D *5/04*
U.S. Cl. 364—424.05 4 Claims

1. A motor control system for an electric power steering apparatus mounted on a motor vehicle with wheels and a steering wheel operatively connected to said wheels, said system having an electric motor for assisting the operation of said steering wheel, a torsion torque sensor for detecting a torsion torque in said steering apparatus and providing a torsion torque signal indicative thereof, a vehicle speed sensor for detecting vehicle speed and providing a vehicle speed signal indicative thereof, a steering angle sensor for detecting a steering angle of said steering wheel and providing a steering angle signal indicative thereof, and controlling means responsive to said torsion torque signal, said vehicle speed signal and said steering angle signal for controlling a rotational direction and output torque of said electric motor so as to assist the operation of said steering wheel, said system comprising:

hysteresis means which defines a hysteresis width for eliminating undesirable disturbances in said torsion torque signal over the entire range of said torsion torque signal by removing variations of said torsion torque signal within



said hysteresis width whereby said signal variations are removed to thereby produce a corrected torsion torque signal, said hysteresis means being responsive to said vehicle speed signal for designating said hysteresis width, said hysteresis means increasing said hysteresis width in accordance with increase of said vehicle speed so as to effectively eliminate external disturbances thereon;

calculating means responsive to said corrected torsion torque signal corrected by said hysteresis means for calculating a compensation torque to produce a compensation torque signal; and

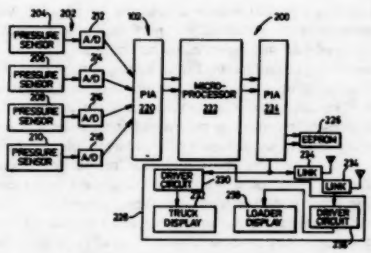
said controlling means responsive to said compensation torque signal for controlling said electric motor.

5,182,712

DYNAMIC PAYLOAD MONITOR

Christos T. Kyrtsos, Peoria, and Adam J. Gudat, Edelstein, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 14, 1990, Ser. No. 582,071
Int. Cl.[5] G01G *19/08*
U.S. Cl. 364—424.07 14 Claims



1. An apparatus for measuring the load supported by a strut of a work vehicle, the strut being disposed in supporting relation to a load carrying portion of the work vehicle, the measuring of said load occurring while the work vehicle is in motion, comprising:

means for sensing the internal pressure of said strut and

delivering a pressure signal responsive to the magnitude of said internal pressure;

logic means for receiving said pressure signal, detecting a compression condition of said strut, determining a pressure differential correlative to said compression condition, determining the load supported by said strut as a function of said pressure differential, and delivering a load signal indicative of said load; and,

memory means for receiving said load signal and recording said load signal as an indication of the magnitude of the load supported by said strut.

5,182,713

TURNING BRAKE CONTROLLING SYSTEM FOR USE IN POWER SHOVEL

Hidenori Kitoh, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

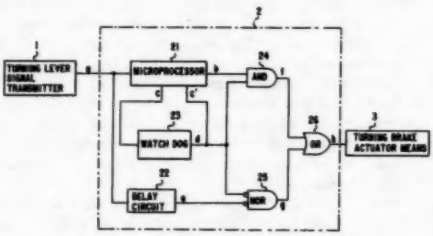
PCT No. PCT/JP89/00304, § 371 Date Jan. 11, 1990, § 102(e) Date Jan. 11, 1990, PCT Pub. No. WO89/09310, PCT Pub. Date Oct. 5, 1989

Continuation of Ser. No. 696,276, May 2, 1991, abandoned, which is a continuation of Ser. No. 445,631, Jan. 11, 1990, abandoned. This PCT application Mar. 22, 1989, Ser. No. 832,643

Claims priority, application Japan, Mar. 22, 1988, 63-65881; May 19, 1988, 63-120501

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—424.01 **4 Claims**



1. A turning brake controlling system for use in an upper turning body of a power shovel, comprising:

a microprocessor means for receiving a turning lever signal from a turning lever signal transmitter when a turning lever is shifted from a turning portion to a neutral position thereof, and for transmitting a turning brake actuating signal to the turning brake actuator means;

a microprocessor monitoring means operably connected to said microprocessor means for monitoring an operation of said microprocessor means;

a hardware circuit means connected in parallel with said microprocessor means for performing arithmetic functions of said microprocessor means; and

a switching circuit means for switching output of said microprocessor means over to an output of said hardware circuit means in accordance with the actuation of said microprocessor monitoring means, wherein at least one of said microprocessor means and hardware circuit means includes a turning speed detector means for detecting a turning speed of said upper turning body when said turning lever is shifted from said turning position to said neutral position thereof and subsequent speeds thereof, and for outputting a turning speed signal corresponding to a detected turning speed; and a turning brake signal generator means for receiving said turning speed signal outputted by said turning speed detector means and said turning lever signal outputted by said turning lever signal transmitter means and for outputting a turning brake signal to said turning brake actuator means, and wherein said turning brake signal generator means is arranged to output a turning brake signal in a delay time which is present in accordance with the value of said turning speed signal.

5,182,714

DIGITIZING CONTROL APPARATUS

Hitoshi Matsuura, Hachioji, Japan, assignor to Fanuc Ltd., Japan

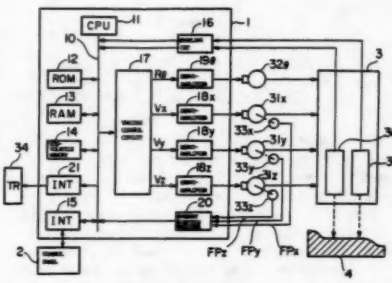
PCT No. PCT/JP90/00615, § 371 Date Jan. 8, 1991, § 102(e) Date Jan. 8, 1991, PCT Pub. No. WO90/14924, PCT Pub. Date Dec. 13, 1990

PCT Filed May 15, 1990, Ser. No. 623,664

Claims priority, application Japan, May 30, 1989, 1-136746

Int. Cl.[5] G05B *19/405;* **B23Q** *35/127*

U.S. Cl. 364—474.03 **3 Claims**



1. A digitizing control apparatus for successively receiving positional data and producing NC data while tracing a shape of a model having a surface, comprising:

a tracer head having first and second non-contact-type distance detectors for independently measuring distances between said first and second non-contact-type distance detectors and the surface of the model, the first and second non-contact-type distance detectors being positioned to travel parallel to a feed direction;

sampling means for sampling measured values from said first and second distance detectors at predetermined times;

memory means for storing a previously sampled first measured value from said first non-contact-type distance detector and a previously sampled second measured value from said second non-contact-type distance detector; and

calculating means for determining data in a normal direction of said surface of the model based on at least three of said first measured value, said second measured value, a presently sampled third measured value from said first non-contact-type distance detector, and a presently sampled fourth measured value from said second non-contact-type distance detector, and for generating the NC data using the data.

5,182,715

RAPID AND ACCURATE PRODUCTION OF STEREOLIGHOGRAPHIC PARTS

Thomas J. Vorgitch, Simi Valley; Raymond A. Bradford, Los Angeles; Grady O. Floyd, Newhall; Harry L. Tarnoff, Van Nuys; Wayne A. Vinson, Valencia; Frank F. Little, Lakeview; Richard A. Harlow, Marina Del Rey; Wolfgang Schwarzinger, Moorpark; Paul H. Marygold, Monrovia; Mark A. Lewis, Valencia; Yehoram Uziel, Northridge; Borzo Modrek, Montebello; Robert T. Pitlak, Westlake Village, and Thomas P. Chen, Saugus, all of Calif., assignors to 3D Systems, Inc., Valencia, Calif.

Continuation of Ser. No. 428,492, Oct. 27, 1989, abandoned. This application Jan. 22, 1992, Ser. No. 824,819

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—474.24 **13 Claims**

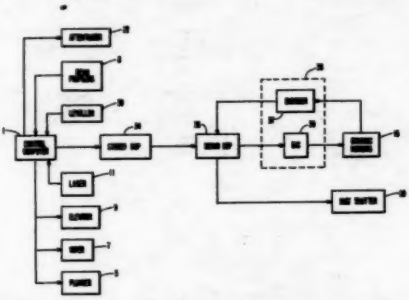
1. A stereolithography system for forming a three-dimen-

sional object from a medium capable of selective physical transformation upon exposure to synergistic stimulation comprising:

a surface of said medium capable of selective physical transformation;

a means for generating a beam of synergistic stimulation, said beam following an optical path to the surface of said medium capable of selective physical transformation;

a servo-controlled dynamic mirror system placed along said optical path for directing said beam of synergistic stimulation to said medium surface, and for selectively positioning said beam across the surface of said medium capable of selective physical transformation to selectively form beam tracings of solidified material at said medium surface in the



shape of a layer of said object, in response to the issuance of successive commands;

a dedicated processor means coupled to said dynamic mirror system for successively issuing said successive commands to said dynamic mirror system from stereolithography data descriptive of said beam tracings; and

a general purpose processor means coupled to said dedicated processor means which receives external CAD/CAM data descriptive of the borders of layers of the three-dimensional object, and thereafter transforms that data into stereolithography data descriptive of the beam tracings of each layer including internal portions of a layer, and transfers that data to said dedicated processor for controlling said dynamic mirror system to direct said beam of synergistic stimulation to said medium surface.

5,182,716

INJECTION MOLDING CONTROLLER WITH CONTROLLED VARIABLE LEARNING

James W. Stroud, III, Cleveland, and John F. Dodds, Newbury, both of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Jun. 15, 1990, Ser. No. 538,813

Int. Cl.[5] G05B *13/02*; B29C *45/77*

U.S. Cl. 364—476 **7 Claims**

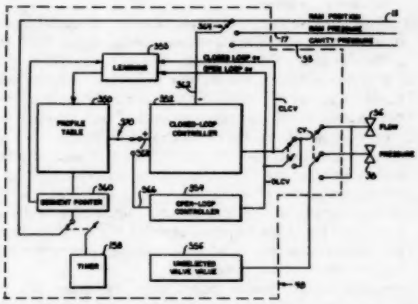
1. A controller for use with an injection molding machine having a ram to inject plastic material with a ram pressure into a mold cavity to produce a mold cavity pressure during at least one stage of an injection molding cycle, the injection molding machine having a valve for receiving a control signal and controlling the ram and a transducer for producing a process signal related to the response of the ram to the control signal, the controller comprising:

a memory for storing a profile for a stage comprised of a plurality of segments each associated with a setpoint;

a segment pointer for addressing the memory and identifying a current segment and its setpoint and for producing a transition signal at the end of a segment;

an open-loop control means for receiving the current setpoint determined by the segment pointer and converting it to a first control signal for controlling the valve during a first period during the current segment;

a closed-loop control means for receiving the process signal from the injection molding machine and the current setpoint determined by the segment point to produce a second control signal for controlling the valve during a second period during the current segment and after the first period; and



a setpoint correcting means responsive to the transition signal to compare the first control signal to the second control signal and to correct the current setpoint in the memory to reduce a difference between the first control signal and second control signal for that segment during the next injection molding cycle.

5,182,717

DEVICE FOR TESTING A NETWORK OF COMPONENTS, IN PARTICULAR AN ELECTRONIC CIRCUIT

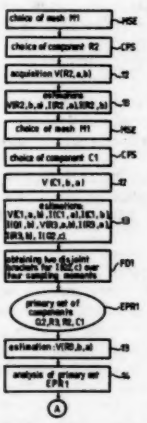
Pierre Luciani, Garches; Philippe Deves, Plaisir, and Patrick Tallibert, Marly-le-Roi, all of France, assignors to Dassault Electronique, Saint Cloud, France

Filed Jul. 5, 1990, Ser. No. 548,381

Claims priority, application France, Jul. 13, 1989, 89 09523; Mar. 2, 1990, 90 02677

Int. Cl.[5] G06F *15/20*; G01R *27/00*

U.S. Cl. 364—481 **57 Claims**



1. An electronic device for testing a network of components, comprising

(A) interface means comprising

(As) means for defining sampling instants in a chosen time interval,

(Ab) means for identifying at least one component of the network,

(Ac) probe means for the acquisition of a physical value relating to the state of functioning of this component, and

(Ad) means cooperating with the probe for providing a series of samples of this physical value within the chosen time interval;

(B) a functional models memory contains component expressions relating to physical values concerning at least one particular kind of component;

(C) a values memory for storing several sample series of physical values corresponding to the same time interval but relating to different components of said network; and

(D) processing means connected to said values memory and to said functional models memory and to said interface means for effecting a processing procedure comprising an estimation of the physical values over said time interval, taking into account the expressions contained in said models memory and the acquired samples and their storage in the values memory, as well as tests on the values contained in the values memory,

wherein said functional models memory further contains law-expressions representing general relationships between physical values;

wherein at least some of said acquired samples are stored in said functional models memory with precision brackets;

wherein the expressions for functional models stored in said functional models memory are at least in part provided with uncertainty brackets;

wherein any estimation is stored in said functional models memory with its estimated uncertainty bracket deriving from at least some of said uncertainty brackets and said precision brackets; and

wherein when said functional models memory contains, for at least some of the sampling instants, a first bracket and a second bracket of different origins for the same physical value established on the basis of the contribution of a primary set of components, these two brackets are compared, and the processor means is adapted for deducing therefrom first information regarding the functioning of the components of this primary set.

5,182,718

METHOD AND APPARATUS FOR WRITING A PATTERN ON A SEMICONDUCTOR SAMPLE BASED ON A RESIST PATTERN CORRECTED FOR PROXIMITY EFFECTS RESULTING FROM DIRECT EXPOSURE OF THE SAMPLE BY A CHARGED-PARTICLE BEAM OR LIGHT

Kenji Harafuji, Moriguchi; Akio Misaka, Hirakata; Hiromitsu Hamaguchi, Moriguchi, and Kenji Kawakita, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 29, 1990, Ser. No. 500,926

Claims priority, application Japan, Apr. 4, 1989, 1-085413

Int. Cl.[5] G06F *15/60;* H01J *37/304*

U.S. Cl. 364—490 **24 Claims**

1. A method of writing a pattern on a semiconductor sample based upon a resist pattern involving various design patterns by application of a charged-particle beam or light, said pattern being for use in manufacture of a semiconductor integrated circuit device having circuit portions corresponding to said pattern, said method comprising:

(a) obtaining pattern data representing design patterns included in a pattern;

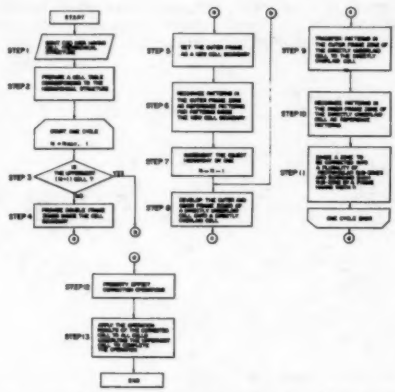
(b) developing said pattern data such that said design patterns are arranged in cells having a hierarchical relationship and corresponding to exposure patterns on the sample to be exposed to a charged-particle beam or light;

(c) correcting said pattern data for proximity effects resulting from exposing resins coated on the sample to a charged-particle beam or to light by:

(i) providing a first frame zone having a predetermined width inside a boundary of each cell;

(ii) providing a second frame zone having a predetermined width inside said first frame zone; and

(iii) performing proximity effect correction operations to obtain a proximity-effect-corrected pattern such that a pattern in said second frame zone and a pattern inside said second frame zone are used as a pattern to be corrected and a pattern in said first frame zone is used as a reference



pattern when correcting pattern data in said each cell for proximity effects and a pattern in said first frame zone in said each cell is added to the pattern to be corrected and a pattern in said second frame zone in said each cell is used as a reference pattern when correcting pattern data in a cell directly overlying said each cell for proximity effect; and

(d) writing said sample in accordance with said proximity-effect-corrected pattern.

5,182,719

METHOD OF FABRICATING A SECOND SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE FROM A FIRST SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

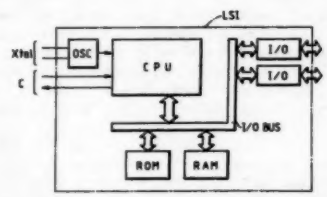
Kenichi Kuroda, Tachikawa, and Akinori Matsuo, Higashiyamato, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi VLSI Engineering Corp., Kodaira, both of, Japan

Continuation of Ser. No. 362,249, Jun. 6, 1989, abandoned. This application Oct. 18, 1990, Ser. No. 598,774

Claims priority, application Japan, Jun. 9, 1988, 63-142723

Int. Cl.[5] G06F *15/60;* H01L *27/00*

U.S. Cl. 364—490 **17 Claims**



1. A method of fabricating a second semiconductor integrated circuit device, on a semiconductor substrate, from a first semiconductor integrated circuit device on the substrate, which second semiconductor integrated circuit device has a microcomputer and a second nonvolatile memory circuit for only reading information, comprising the step of:

converting the first semiconductor integrated circuit device, on the semiconductor substrate, which first semiconductor integrated circuit device has the microcomputer and a first nonvolatile memory circuit capable of having information electrically written thereinto and capable of having the information erased therefrom, into the second semiconductor integrated circuit device, said first nonvolatile memory circuit including a memory cell array, an information reading circuit for said memory cell array, and an information writing circuit for said memory cell array, said converting step including the sub-steps of (a) leaving a circuit arrangement of an information reading circuit of the first nonvolatile memory circuit substantially unchanged; (b) revising part of the memory cell array of said first nonvolatile memory circuit of said first semiconductor integrated circuit device; and (c) bringing the information writing circuit into a logically inactive state.

5,182,720

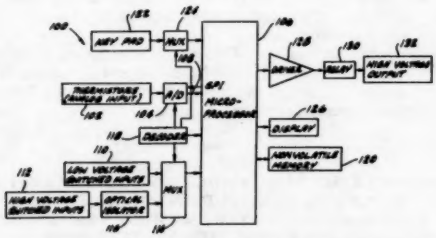
APPARATUS FOR CONTROLLING AND MONITORING A LUBRICATING SYSTEM

David C. Beck, St. Ann, Mo., and Philip M. Gundlach, Jr., Highland, Ill., assignors to McNeil (Ohio) Corporation, St. Paul, Minn.

Continuation of Ser. No. 623,205, Dec. 6, 1990, abandoned. This application Apr. 20, 1992, Ser. No. 871,573

Int. Cl.[5] F01M *1/18, 1/16*

U.S. Cl. 364—509 **23 Claims**



1. An apparatus for controlling and monitoring a lubrication of a system having analog sensors detecting lubrication events and switches indicating a status of a lubricating system having vents, an oil level, a pressure and a cycle, said apparatus comprising:

means, responsive to the analog sensors and switches, for providing a plurality of digital sensing signals representative of lubrication events and of the status of the lubricating system;

means, including a nonvolatile memory, for storing instructions;

means, responsive to an operator, for selecting operating parameters of the lubricating system;

means for inputting the selected parameters into the nonvolatile memory of the storing means;

means for processing the digital sensing signals by comparing the digital sensing signals to the selected parameters stored in the storing means;

means, responsive to both the providing means and the processing means, for initiating lubrication events by the lubricating system; and

means, responsive to the processing means, for indicating the status of the lubricating system, the processing means operating in a review mode as selected by the operator via said inputting means in which selected parameters are displayed by the indicating means.

5,182,721

PROCESS AND APPARATUS FOR CONTROLLING THE INKING PROCESS IN A PRINTING MACHINE

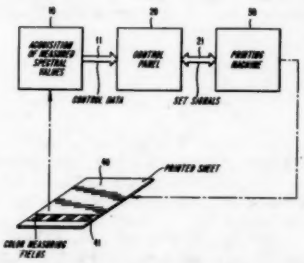
Helmut Kipphan, Schwetzingen; Gerhard Löffler, Walldorf, both of Fed. Rep. of Germany; Guido Keller, Zürich, and Hans Ott, Regensdorf, both of Switzerland, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany and Gretak Aktiengesellschaft, Switzerland

Continuation of Ser. No. 213,000, Jun. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 939,966, Dec. 10, 1986, abandoned. This application Sep. 28, 1990, Ser. No. 590,060

Claims priority, application Switzerland, Dec. 10, 1985, 5262/85

Int. Cl.[5] G01J *3/46*; G06F *15/20*

U.S. Cl. 364—526 **37 Claims**



1. Process for controlling the application of ink by a printing machine comprising the steps of:

photoelectrically measuring a printed sheet printed by the machine in a plurality of printed test areas;

determining, from said measured test areas, color positions of the test areas relative to a selected color coordinate system wherein a unique color position exists for each measured color;

establishing reference color positions according to the selected color coordinate system;

determining color deviations between the color positions of the test areas measured and corresponding reference color positions;

calculating control data on the basis of said individual color deviations; and

automatically controlling the inking process on the basis of said calculated control data.

5,182,722

APPARATUS FOR ASSESSING THE STIFFNESS OF A SHEET

David A. Hain, Dundee, Scotland, assignor to NCR Corporation, Dayton, Ohio

Filed Nov. 29, 1990, Ser. No. 619,847

Claims priority, application United Kingdom, Aug. 8, 1990, 9017420

Int. Cl.[5] B07C *1/16, 5/34*; G01L *5/04*; G07D *7/00*

U.S. Cl. 364—551.01 **11 Claims**

1. An apparatus for assessing the stiffness of a sheet, comprising:

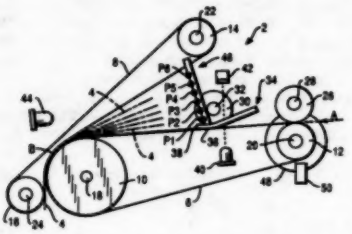
conveying means for conveying said sheet along a feed path;

bending means in said feed path for providing a curvature in said sheet;

constraining means for constraining the trailing edge of said sheet to move along said feed path until said curvature has been imparted to at least a portion of said sheet and until said trailing edge has moved past a predetermined location along said feed path;

sensing means arranged for detecting movement of said

trailing edge away from said feed path after said trailing edge has moved past said predetermined location; and

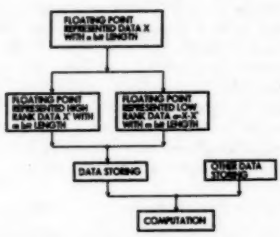


data processing means for assessing the stiffness of said sheet in response to the output of said sensing means.

5,182,723
COMPUTING METHOD OF FLOATING-POINT REPRESENTED DATA

Masatsugu Kamimura, Kobe, Japan, assignor to Fujitsu Ten Limited, Japan

Filed Sep. 30, 1991, Ser. No. 767,896
Claims priority, application Japan, Oct. 2, 1990, 2-263009
Int. Cl.[5] G06F *7/38*
U.S. Cl. 364—748 **4 Claims**


FLOATING POINT REPRESENTED DATA X WITH n bit LENGTH
FLOATING POINT REPRESENTED HIGH RANK DATA X WITH n bit LENGTH
FLOATING POINT REPRESENTED LOW RANK DATA = X-X' WITH m bit LENGTH
DATA STORING
OTHER DATA STORING
COMPUTATION

1. A computing method of a floating-point represented bit data X having an exponential part and a mantissa part, the mantissa part including first and second mantissa parts, comprising the steps of:

(a) storing the floating-point represented bit data X in an n bit length register;

(b) storing a floating-point represented high rank bit data X' having first and second high rank data parts, with the exponential part and the first mantissa part of the floating-point represented bit data X in the n bit length register in the first high rank data part and with zeros in the second high rank data part, in a first m bit length register wherein n is greater than m;

(c) storing a floating-point represented low rank bit data α obtained by subtracting said floating-point represented high rank bit data X' from said floating-point represented bit data X in the n bit length register, in a second m bit length register;

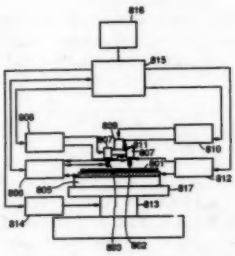
(d) computing other floating-point bit data stored in a third m bit length register, using said floating-point represented high rank bit data X' and said floating-point represented low rank bit data α registered in the first and second m bit length registers to obtain accurate floating-point data; and

(e) storing said accurate floating-point data in a fourth m bit length register.

5,182,724
INFORMATION PROCESSING METHOD AND INFORMATION PROCESSING DEVICE

Yoshihiro Yanagisawa, Atsugi; Kunihiro Sakai, Isehara; Osamu Takamatsu, Atsugi; Ken Eguchi, Yokohama; Hiroshi Matsuda, Isehara; Hisaaki Kawade, Yokohama, and Toshihiko Takeda, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 579,041
Claims priority, application Japan, Sep. 7, 1989, 1-233652; Apr. 18, 1990, 2-104059; Aug. 3, 1990, 2-206606
Int. Cl.[5] G11C *13/00*; G11B *9/00*
U.S. Cl. 365—151 **36 Claims**



1. An information processing method, comprising the steps of:

providing a recording medium having a recording layer on an electrode substrate having a regular periodic structure within a plane;

determining a recording position on the periodic structure of the substrate through the recording layer by use of a first probe electrode; and

performing at least one of recording, reproducing and erasing of information by use of a second probe electrode at a desired position on the recording layer corresponding to the determined recording position.

5,182,725
NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH REDUCED VARIATION IN SOURCE POTENTIAL OF FLOATING GATE TYPE MEMORY TRANSISTOR AND OPERATING METHOD THEREFOR

Nobuaki Andoh; Kenji Kohda; Tsuyoshi Toyama; Kenji Noguchi, and Shinichi Kobayashi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 564,667, Aug. 9, 1990, Pat. No. 5,105,386, which is a continuation of Ser. No. 265,225, Nov. 1, 1988, abandoned. This application Sep. 25, 1991, Ser. No. 765,300
Claims priority, application Japan, Nov. 20, 1987, 62-294555
Int. Cl.[5] G11C *11/34*
U.S. Cl. 365—185 **6 Claims**

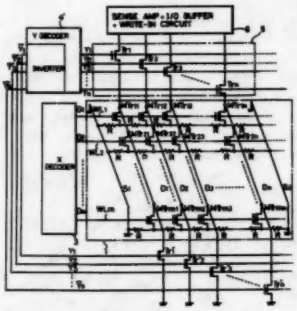
1. A method for driving a nonvolatile semiconductor memory device comprising a plurality of memory elements, one memory element arranged at each intersection in a matrix of rows and columns for storing information in a nonvolatile manner, each of said memory elements having a first conduction region connected to an associated column line and a second conduction region, second conduction regions of memory elements on a same row being connected together through a source layer having a distributed resistance, comprising the steps of:

selecting a row of said plurality of memory elements in response to a row address externally applied;

selecting at least one column of said plurality of memory elements in response to a column address externally applied; and

coupling columns, excluding any selected column, directly to ground potential to reduce variations in source resis-

tance and thereby equalize potential of each respective second conduction region of memory elements in a selected row in response to said column address externally applied,



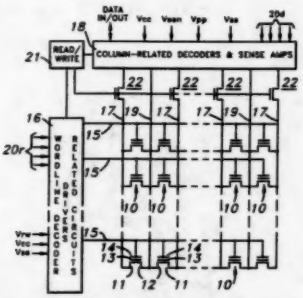
wherein said coupling step includes the step of inverting an output used for column selection.

5,182,726

CIRCUIT AND METHOD FOR DISCHARGING A MEMORY ARRAY

John F. Schreck, and Phat C. Truong, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 23, 1991, Ser. No. 645,078
Int. Cl.[5] G11C *11/40*
U.S. Cl. 365—203 **18 Claims**



10. A circuit for discharging column lines of a memory array, comprising:

a resistor, said resistor connected between a supply voltage and a common node, said resistor enabled by a program enable signal;

at least one driver transistor of a first conductivity-type, said driver transistor having a source-drain path and a gate, said source-drain path of said driver transistor connected between a said column line and reference potential, said gate of said driver transistor coupled to said common node;

an enabling transistor of said first conductivity-type, said enabling transistor having a source-drain path and a gate, said source-drain path of said enabling transistor connected between said reference potential and said common node, said gate of said enabling transistor connected to said program enable signal;

at least one inverter, an OR circuit, and a bypass transistor of a second conductivity-type, said bypass transistor having a source-drain path and a gate, said source-drain path of said bypass transistor connected between said supply voltage and said common node, said gate of said bypass transistor coupled to said common node through said at least one inverter and said OR circuit, said program enable signal coupled to said OR circuit;

a first transistor of said first conductivity-type, said first transistor having a source-drain path and a gate, said source-drain path of said first transistor connected between said gate of said driver transistor and said reference potential, said gate of said first transistor connected to a virtual ground signal; and

a second transistor of said first conductivity-type, said second transistor having a source-drain path and a gate, said source-drain path of said third transistor connected between said gate of said driver transistor and said reference potential, said gate of said second transistor connected to said program enable signal;

wherein said resistor is a third transistor of said second conductivity-type, said third transistor having a source-drain path and a gate, said source-drain path of said third transistor connected between a supply voltage and a common node, said gate of said third transistor connected to said program enable signal;

wherein said source-drain path of said third transistor has a larger resistance than said source-drain path of said driver transistor;

wherein said driver transistor is a N-channel transistor; and

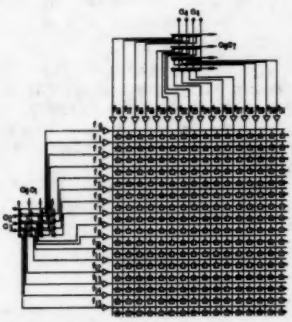
wherein said common node is coupled to said gate of said driver transistor by a fourth transistor of said second conductivity-type, said fourth transistor having a source-drain path and a gate, said source-drain path of said fourth transistor connected between said common node and said gate of said driver transistor, said gate of said fourth transistor connected to said virtual ground signal.

5,182,727

ARRAY LAYOUT STRUCTURE FOR IMPLEMENTING LARGE HIGH-DENSITY ADDRESS DECODERS FOR GATE ARRAY MEMORIES

Charles S. McFalls, Jr., Durham; Patrick A. Sproule, Raleigh, and Michael A. Mullins, Durham, all of N.C., assignors to Mitsubishi Semiconductor America, Inc., Durham, N.C.

Filed Oct. 9, 1991, Ser. No. 773,827
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—230.06 **40 Claims**



1. An address signal decoder for providing decoded address signals to respective word lines in response to an address signal, comprising:

pluralities of first and second subdecoder output lines arrayed in rows and columns to form a plurality of matrices extending in a row direction;

a rectangular column subdecoder for receiving a first portion of said address signal and supplying first subdecoded address signals to respective first subdecoder output lines;

a plurality of rectangular row subdecoders formed outside said matrices and extending in said row direction, each

decoder for receiving a second portion of said address signal and each supplying second subdecoded address signals to respective second subdecoder output lines; and

a plurality of first combinational logic elements connected to corresponding first and second subdecoder output lines for responding to said first and second subdecoded address signals to supply decoded address signals to respective word lines.

5,182,728

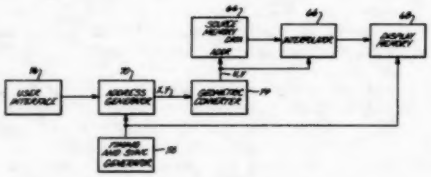
ULTRASOUND IMAGING SYSTEM AND METHOD

Michael C. S. Shen, Tempe, and Christopher P. Zobkiw, Scottsdale, both of Ariz., assignors to Acoustic Imaging Technologies Corporation, Phoenix, Ariz.

Filed Jun. 28, 1991, Ser. No. 723,459

Int. Cl.[5] G03B *42/06*

U.S. Cl. 367—7 **9 Claims**



1. An ultrasound imaging system comprising:

means for transmitting an ultrasound signal toward a target to be displayed in two dimensions;

means for receiving echoes of the ultrasound signal from the target;

means for storing two dimensional target data acquired from the received echoes;

a visual display;

means for presenting the two dimensional target data on the visual display as a background image;

means for overlaying part of the target data over the background image as a foreground image on the visual display;

means for changing the location of the foreground image on the visual display and for changing the overlaid part of the target data as the location changes; and

means for changing the size of the foreground image vis-a-vis the background image.

5,182,729

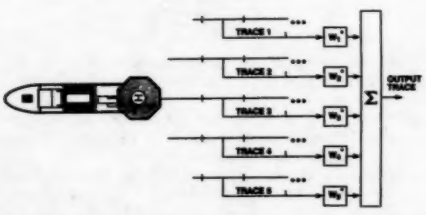
REDUCTION OF SIDESWIPE NOISE FROM SEISMIC DATA BY NULL STEERING

Richard E. Duren, Spring, and Stanley V. Morris, Deer Park, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Sep. 3, 1991, Ser. No. 753,743

Int. Cl.[5] G01V *1/36, 1/28*

U.S. Cl. 367—38 **11 Claims**



1. A method of removing the effects of unwanted out-of-plane energy contributions to seismic survey data along a seismic line of profile in a plane generally normal to the surface of the earth, comprising the steps of:

(a) recording the seismic data collected from a seismic receiver geometry comprising receivers in-plane with the line of profile and receivers out-of-plane with the line of profile;

(b) ordering the data in cross-line order in which seismic events along the line of profile are aligned in time and out-of-plane energy takes the form of a series of saw-toothed seismic events arriving at different times in the different lines of receivers; and

(c) filtering the seismic data to remove the series of saw-toothed seismic events and thereby the effects of unwanted out-of-plane energy from the seismic data.

5,182,730

METHOD AND APPARATUS FOR TRANSMITTING INFORMATION IN A BOREHOLE EMPLOYING SIGNAL DISCRIMINATION

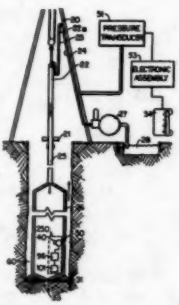
Serge A. Scherbatskoy, 3921 Clayton Rd. E., Fort Worth, Tex. 76116

Continuation of Ser. No. 275,706, Nov. 22, 1988, which is a continuation of Ser. No. 140,960, Jan. 5, 1988, abandoned, which is a continuation of Ser. No. 75,686, Jul. 20, 1987, abandoned, which is a continuation of Ser. No. 924,046, Oct. 28, 1986, abandoned, which is a continuation of Ser. No. 811,952, Dec. 20, 1985, abandoned, which is a continuation of Ser. No. 718,895, Apr. 2, 1985, abandoned, which is a continuation of Ser. No. 443,138, Nov. 19, 1982, abandoned, which is a division of Ser. No. 383,269, May 28, 1982, Pat. No. 4,520,468, which is a continuation of Ser. No. 68,526, Aug. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 851,677, Dec. 5, 1977, abandoned. This application Aug. 23, 1991, Ser. No. 749,287

The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.

Int. Cl.[5] G01V *1/40*

U.S. Cl. 367—83 **18 Claims**



16. For use in conducting measurement operations in drill holes, the method of obtaining useful downhole information by selectively filtering data signals carrying said information from mixed signals resulting from a mixture of said data signals and of interfering signals, said data signals being arranged in a coded sequence of individual signals, said sequence being arranged in accordance with a code representing said useful information and wherein said individual signals have a characteristic shape, said method comprising:

a) introducing said mixed signals into an input of a digital filter;

b) selecting the memory function of said digital filter so that using said input and said memory function the output of said digital filter produces output signals representative of an approximation of said individual signals; and

c) producing an indication of said useful information from said individual signals.

5,182,731

WELL BORE DATA TRANSMISSION APPARATUS

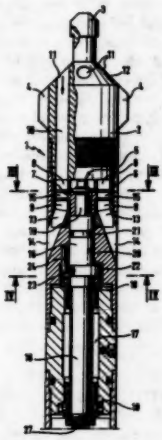
Hans-Juergen Hoelscher, Hannover; Thomas Kerk, Clausthal-Zellerfeld; Wilfried Tuennermann, Giesen, and Helmut Winnacker, Ehlershausen, all of Fed. Rep. of Germany, assignors to Preussag Aktiengesellschaft, Hannover, Fed. Rep. of Germany

Filed May 29, 1992, Ser. No. 889,888

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1991, 4126249

Int. Cl.[5] G01V *1/40*

U.S. Cl. 367—84 11 Claims



1. A hydromechanical signal transmitter apparatus for transmitting information signals in a flowing liquid medium by generation of pressure pulses in the medium comprising:

a housing (2) of generally cylindrical form having an axis;

a hydromechanical signal transmitter (5) in said housing, said transmitter comprising a stator (6) fixed within the housing and a disc shaped rotor (7) rotatable relative to the stator about said axis;

said stator having at least one pair of liquid passage (8,9) extending through said housing for passing fluid of said liquid medium therethrough, said at least one pair of passages being axially aligned with each other and disposed on opposite sides of said disc shaped rotor (7);

said disc shaped rotor (7) having openings (15) formed therein at positions corresponding to each of said at least one pair of passages, said rotor being rotatable between a passing position wherein fluid in said passages (8,9) passes through a corresponding opening (15) aligned therewith and a throttling position wherein said rotor is moved to a position such that flow of fluid through said passages is obstructed by a closed portion of said disc shaped rotor;

drive shaft means (16) connected to said rotor for rotating the rotor between said passing position and said throttling position, said drive shaft means having radial stop faces (25,26) which abut against a stop means (24) integral with said housing to stop rotation of said rotor at limit positions corresponding to said passing and throttling positions, respectively; and

reversible motor means for driving said shaft means in accordance with information signals provided thereto to control movement of said rotor of said hydromechanical signal transmitter (5) between said limit positions to generate pressure pulses in said fluid corresponding to said signals.

5,182,732

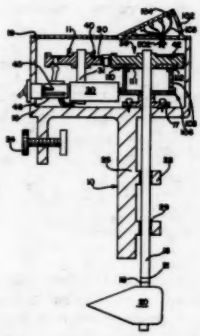
REVERSIBLE FISH FINDER APPARATUS

Oleg Pichowkin, 1422 Ashland Ave., Evanston, Ill. 60201

Filed Oct. 29, 1991, Ser. No. 784,550

Int. Cl.[5] H04R *17/00*

U.S. Cl. 367—173 18 Claims



1. A fish finder having a reversible drive assembly for driving a sonar transducer in a preselected pattern, comprising:

a sonar transducer;

means for mounting the transducer to a boat, the mounting means including an elongated mounting member having said transducer mounted therein, said mounting member holding said transducer at a predetermined elevation with respect to the boat, said mounting means further including a housing which rotatably receives said a portion of said mounting member therein;

motor means for supplying rotational drive to said sonar transducer;

a gear train interconnecting the motor means and the transducer, the gear train transmitting rotational drive from said motor means to said transducer, said gear train including at least a drive gear and a driven gear, the drive gear being operatively connected to said motor means in a manner such that said motor means supplies rotational drive to said drive gear, the driven gear being operatively connected to said mounting member, said drive gear and said driven gear operatively engaging each other such that said drive gear supplies rotational drive to said driven gear and said sonar transducer;

means for reversing the drive supplied by said motor means to said gear train whereby rotation of said sonar transducer is reversed; and,

means for actuating said drive reversing means, the actuating means being operatively connected to said drive gear.

5,182,733

READILY SETTABLE BALANCED DIGITAL TIME DISPLAYS

Berj A. Terzian, Briarcliff Manor, N.Y., assignor to Equitime, Inc., Briarcliff Manor, N.Y.

Continuation of Ser. No. 695,444, May 3, 1991, abandoned. This application Sep. 17, 1991, Ser. No. 760,817

Int. Cl.[5] G04C *19/00, 9/00*

U.S. Cl. 368—82 22 Claims

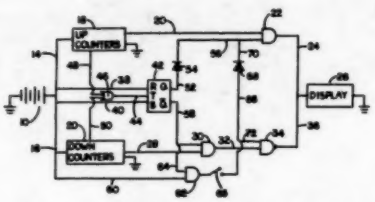
1. In a balanced digital time display, wherein normal time is displayed by a current hour digit followed by incrementing elapsed minute digits and by a next hour digit preceded by decrementing remaining minute digits during, respectively, initial and subsequent periods of the same current hour, a modification for facilitating setting of the display which comprises:

(a) means for counting current hours and incrementing elapsed minutes;

(b) means for counting next hours and decrementing remaining minutes;

(c) means for selectively switching the display from a normal time mode to a setting mode and back to the normal time mode; and

(d) means responsive to said switching to the setting mode, when carried out while the display shows a next hour digit preceded by decrementing remaining minutes, for converting the display into the then equivalent elapsed normal time shown by the current hour digit followed by incrementing elapsed minutes to enable setting the display to elapsed normal time, and also responsive to said switching back to the normal time mode for reverting the display into the then equivalent remaining normal time shown by the next hour digit preceded by decrementing remaining minutes.



5,182,734

MAGNETO-OPTICAL RECORDING APPARATUS WITH PULSE DRIVEN LIGHT BEAM AND VARIABLE DELAY OF MAGNETIC FIELD REVERSALS BASED ON RECORDING MEDIUM CHARACTERISTICS

Tetsu Watanabe, Tokyo; Tetsuji Kawashima, and Goro Fujita, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

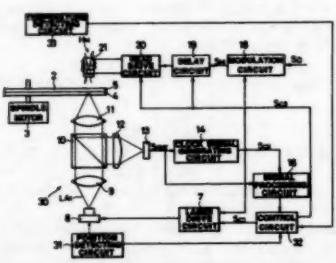
PCT No. PCT/JP89/00612, § 371 Date Feb. 20, 1990, § 102(e) Date Feb. 20, 1990, PCT Pub. No. WO89/12889, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 19, 1989, Ser. No. 465,123

Claims priority, application Japan, Jun. 24, 1988, 63-157729; Oct. 18, 1988, 63-263503

Int. Cl.[5] G11B *11/10, 11/12, 13/04*

U.S. Cl. 369—13 **9 Claims**



1. A magneto-optical recording apparatus for recording information onto a magneto-optical recording medium, comprising:

optical head means movable relative to said recording medium and including light generating means for directing a light beam to said recording medium for forming a light beam spot on said recording medium which scans the recoding medium and thereby causes irradiating of said recording medium where said light beam spot scans the recording medium, and detection means for detecting light reflected from said recording medium at said light beam spot;

clock signal generating means responsive to said detection means for generating a predetermined reference clock signal supplied to said light generating means which responds to said reference clock signal for causing said light generating means to intermittently produce said light beam in a pulse driving mode thereof so that said light beam spot is then intermittently produced and results in irradiated areas disposed one after the other on said recording medium at a timing determined by said reference clock signal;

magnetic field generating means for generating a magnetic field having a magnetic polarity and acting on said recording medium at a location on said recording medium which is adjacent to said light beam spot;

magnetic field modulating means receiving said reference clock signal and information data to be recorded for providing a record signal which undergoes reversal of amplitude polarity in timed relation to said reference clock signal and which represents said information data;

delay means through which said record signal is supplied to said magnetic field generating means for causing reversal of said magnetic polarity of said magnetic field in accordance with each reversal of amplitude polarity of said record signal, and which has a variable delay time; and

control means for providing a control signal corresponding to at least one of magnetic and temperature characteristics of said recording medium and which is applied to said delay means for varying said delay time and thereby controlling timing of said reversal of the magnetic polarity of the magnetic field relative to said reference clock signal.

5,182,735

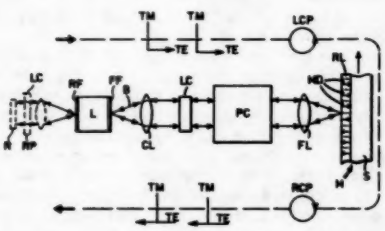
MAGNETO-OPTIC READOUT APPARATUS USING POLARIZATION SWITCHING OF READOUT BEAM

Clark N. Kurtz, Canandaigua, and Joseph J. Miceli, Jr., Macedon, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 6, 1989, Ser. No. 319,031

Int. Cl.[5] G11B *11/00, 13/04*

U.S. Cl. 369—13 **8 Claims**



1. A magneto-optic playback apparatus for playing back information recorded in a magnetic recording layer of a magneto-optic recording element, such information being recorded in the form of vertically magnetized magnetic domains of opposite orientation, such recording layer being of the type which exhibits a differential absorption of left- and right-hand circularly polarized radiation, depending upon the orientation of the magnetic domains irradiated by such incident radiation, said apparatus including a laser adapted to operate in two different modes to produce two different linearly-polarized beams of radiation, the plane of polarization of one beam mode being perpendicular to the plane of polarization of the other beam mode, said laser being arranged to direct both of said beam modes along an optical path toward the magnetic recording layer, such recording layer serving to reflect a portion of a beam of radiation travelling along said path back toward the laser; means for scanning the recording layer with both of said

beam modes of radiation to irradiate the prerecorded information thereon according to a predetermined procedure; optical means for coupling said laser with the recording layer so that, as said beam scans the recording layer and the recording element reflects such beam back to the laser, said optical means selects in which beam mode the laser operates by the orientation of the magnetic domains irradiated by the beam; and photodetector means for continuously detecting in which of the two modes the laser is operating, wherein said optical means comprises: a) an optical loss control element for controlling losses for said beam modes whereby a probability of operation in either beam mode by the laser is substantially equal for either of said two modes in the absence of any coupling of radiation between the laser and recording layer, and b) a polarization converter arranged in the optical path between the laser and recording layer, said polarization converter functioning to (i) convert an incident beam of linearly polarized radiation to a beam of either left-hand or right-hand circularly polarized radiation depending upon the operating mode of the laser, such beam of circularly polarized radiation striking the recording element and being reflected therefrom, and (ii) reconvert the beam of circularly polarized radiation reflected from the recording element to a beam of linearly polarized radiation having a plane of polarization substantially the same as that of said incident beam.

5,182,736

DECELERATION CONTROL SYSTEM FOR POSITIONING AN OPTICAL HEAD IN AN OPTICAL DISK UNIT

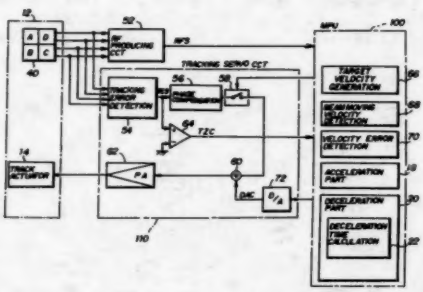
Shigenori Yanagi, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 3, 1990, Ser. No. 593,904

Claims priority, application Japan, Oct. 12, 1989, 1-265587; Oct. 12, 1989, 1-265589

Int. Cl.[5] G11B 7/085

U.S. Cl. 369—32 **20 Claims**



1. A deceleration control system having a velocity control and tracking servo operation for an optical disk unit which includes an optical head for recording information on and/or reproducing information from tracks of an optical disk by use of a light beam emitted form the optical head, a track actuator for moving the light beam in a direction traversing the tracks of the optical disk, and a tracking error signal generation circuit for deriving a tracking error signal TES from a signal which is output from the optical head and is dependent on a light beam received from the optical disk, said tracking error signal being generated every time the light beam traverses a track, said deceleration control system comprising:

velocity control means coupled to the optical head, said velocity control means including first means for generating a target velocity V_t, second means for detecting a beam moving velocity V based on the tracking error signal TES derived by the tracking error signal generation circuit, and third means for detecting a velocity error V_e of the beam moving velocity V with respect to the target velocity V_t and for controlling the track actuator so as to minimize the velocity error V_e; and

deceleration means for decelerating the track actuator, said deceleration means including first means for deriving a deceleration time T based on the beam moving velocity V at a track which precedes the target track and supplying a single deceleration pulse to the track actuator for the deceleration time T starting from a time when the light beam is predetermined distance from the target track for stopping the light beam at the target track, wherein said deceleration pulse is output before said tracking servo operation begins.

5,182,737

SYSTEM FOR READING OPTICAL RECORDING MEDIUM USING REFERENCE LINERS WHICH ARE POSITIONED PERPENDICULAR TO DATA TRACKS

Kiyoshi Horie, Kanagawa, Japan, assignor to Kabushiki Kaisha CSK, Tokyo, Japan

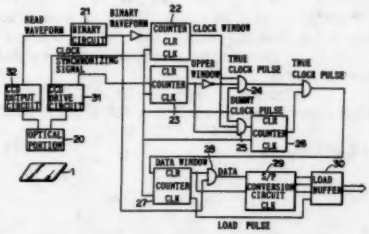
PCT No. PCT/JP89/00955, § 371 Date May 17, 1990, § 102(e) Date May 17, 1990

PCT Filed Sep. 20, 1989, Ser. No. 490,632

Claims priority, application Japan, Sep. 20, 1988, 63-235524

Int. Cl.[5] G11B 7/00

U.S. Cl. 369—47 **5 Claims**



1. A system for reading an optical recording medium, said medium having one or more data regions formed by arranging, in parallel, a plurality of data tracks each of which is constituted by a plurality of bits along a reference line positioned perpendicular to said data tracks, said system for reading an optical recording medium comprising:

a reading portion having a bit included in said data track positioned adjacent to said reference line and comprising a clock bit;

clock window generating means for generating clock windows on the basis of read signals of said data track;

an AND circuit for calculating the logical product of a clock window and a read signal of said clock bit in a data region and generating a true clock pulse or a dummy clock pulse;

converting means for converting said dummy clock pulse into the timing of said true clock pulse in the case of said dummy clock pulse;

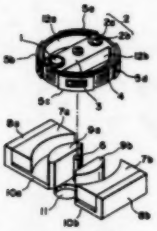
data window generating means for generating data windows on the basis of said true clock, pulse; and

an AND circuit for calculating the logical product of a data window and a read signal.

5,182,738
OBJECTIVE LENS ACTUATOR USING A BALANCE WEIGHT THEREIN

Kikuo Yoshikawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 784,734, Oct. 28, 1991, abandoned, which is a continuation of Ser. No. 605,482, Oct. 30, 1990, abandoned. This application May 11, 1992, Ser. No. 884,231
Claims priority, application Japan, Nov. 10, 1989, 1-291183
Int. Cl.[5] G11B *7/00, 7/08*
U.S. Cl. 369—44.14 **17 Claims**



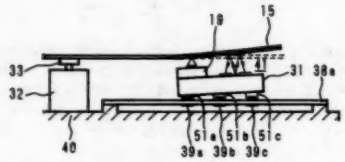
1. An objective lens actuator in an optical pickup device in which an objective lens for focusing a light beam on a recording medium is held in a lens holder, and said objective lens holder is held on a support shaft to be slidable in a direction of an optical axis of said objective lens and pivotal on a plane perpendicular to the optical axis direction, comprising:

a balance weight located on said holder to be substantially axially symmetrical with said objective lens, said balance weight comprising a balance weight body having a predetermined mass, and a damper member arranged between said balance weight body and said lens holder.

5,182,739
APPARATUS FOR MAINTAINING A DISK AND OPTICAL HEAD IN ORTHOGONAL RELATION

Kenjiro Kime; Naoyuki Egusa, and Keiji Nakamura, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jul. 2, 1990, Ser. No. 547,502
Claims priority, application Japan, Jul. 5, 1989, 1-173295
Int. Cl.[5] G11B *7/08*
U.S. Cl. 369—44.15 **11 Claims**



2. An optical head for optically recording/regenerating data to/from a disk, comprising:

a light source,

an object lens for converging light beams from said light source onto the disk,

a lens holder for holding said object lens,

deviation detecting means for detecting a deviation of light spots condensed on the disk by said object lens on the basis of light reflecting from said disk,

a lens actuator means for focusing said object lens according to the amount of deviation of light spots detected by said deviation detecting means,

an actuator supporting base means for supporting said object lens, said lens holder, and said lens actuator means,

a sensor for detecting an angle between an optical axis as defined by a light beam propagating through the center of the object lens and a surface of the disk,

an optical system supporting base means for supporting said light source, deviation detecting means and actuator supporting base means,

a shaft means for guiding the movement of said optical system supporting means,

a plurality of bearings for supporting said optical system supporting means on said shaft means,

a plurality of piezoelectric elements each having a first side and an opposite second side and said piezoelectric elements for correcting an orientation of said object lens and said disk surface in response to detecting by said sensor to orient the optical axis of said object lens to said disk surface,

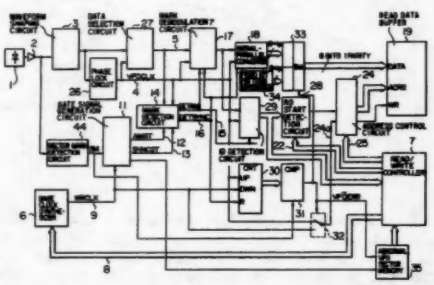
said bearings and said optical system supporting base means each having respective surfaces with outer perimeter edges, and

means for positioning the first side of said piezoelectric elements on the facing surface of said optical system supporting base means and the second side of said piezoelectric elements on the facing surface of said bearings such that the first and second sides of said piezoelectric elements each remain within the outer perimeter edges of both facing surfaces.

5,182,740
METHOD AND APPARATUS FOR CORRECTLY STORING DATA RECORDED ON A ROTATIONAL DISC-SHAPED RECORDING MEDIUM DESPITE OCCURRENCE OF CLOCK SYNCHRONIZATION DISORDER

Takuya Mizokami, and Shinichi Arai, both of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 656,946, Feb. 19, 1991. This application Sep. 6, 1991, Ser. No. 755,819
Claims priority, application Japan, Sep. 20, 1990, 2-248799
Int. Cl.[5] G11B *5/09, 15/52, 20/10, 27/22*
U.S. Cl. 369—47 **20 Claims**



1. A method of data introduction in which a disc-shaped recording medium having a record area formed in a plurality of tracks is rotated at a constant angular velocity, the record area is partitioned into a plurality of zones depending on the radial position, with base clock frequencies being assigned to the zones so that an outer zone has a higher frequency than an inner zone, and blocks of data are recorded or reproduced in each zone in accordance with the base clock of the assigned frequency, comprising the steps of:

reproducing from the recording medium blocks of data and a corresponding variable frequency oscillator (VFO) signal for each block of data which have been recorded on the recording medium;

producing a VFO clock signal for each data block in syn-

chronism with the reproduced VFO signal corresponding to that data block;

detecting synchronization disorder ("sync-disorder") of the VFO clock which occurs during storing of a block of said reproduced data into a reproduced data memory in response to the VFO clock signal; and

storing, in the event of detection of sync-disorder, reproduced data corresponding to recorded data reproduced subsequent to the block of data which was reproduced during a detected sync-disorder to the reproduced data memory in response to the VFO clock signal despite the detected sync-disorder.

5,182,741

OPTICAL DISK RECORDING/REPRODUCING DEVICE UTILIZING A CONSTANT ANGULAR VELOCITY METHOD WITH A CONSTANT LINEAR VELOCITY FORMATTED OPTICAL DISK

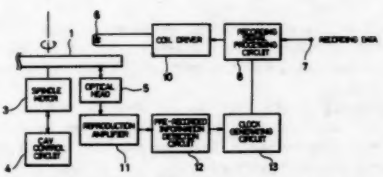
Shigemi Maeda, Yamatokoriyama; Toshihisa Deguchi, Nara, and Shigeo Terashima, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 16, 1990, Ser. No. 568,483

Claims priority, application Japan, Aug. 25, 1989, 1-219314; Aug. 25, 1989, 1-219315

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—50 **32 Claims**



1. An optical disk recording/reproducing device, which records or reproduces information on or from an optical disk, the optical disk having pre-recorded information cyclically provided along tracks so as to permit rotation control by using a constant linear velocity method for an entire region thereof, comprising:

driving means for rotatively driving the optical disk at a constant angular velocity;

reproducing means for reproducing information signals and the pre-recorded information provided on the optical disk;

reference signal generation means for generating reference signals corresponding to a recording frequency of the reproduced pre-recorded information in the information signals reproduced by the reproducing means; and

recording means for performing a recording operation by using a recording frequency in accordance with said reference signal generated by said reference signal generation means.

5,182,742

RECORDING AND/OR REPRODUCING APPARATUS WITH A DISC CARTRIDGE TEMPERATURE SENSOR

Kiyoshi Ohmori, Kanagawa; Shoji Iwaasa, Tokyo, and Goro Fujita, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 8, 1991, Ser. No. 726,779

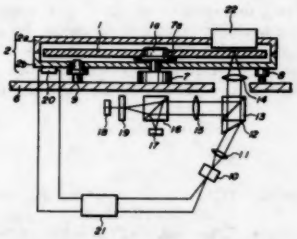
Claims priority, application Japan, Jul. 10, 1990, 2-180611

Int. Cl.[5] G11B *33/02, 7/00, 33/14*

U.S. Cl. 369—116 **15 Claims**

1. A recording and/or reproducing apparatus for recording and/or reproducing information signals on or from a disc rotatably mounted within a disc cartridge, the disc cartridge having a recording layer, the apparatus including means for rotating the disc relative to the disc cartridge and light source means for directing a radiation beam onto the recording layer of the disc as the disc rotates, wherein the information signals can be recorded on or reproduced from the recording layer due to interaction between the beam and the recording layer, wherein the improvement comprises:

temperature sensor means for sensing a temperature of the disc cartridge and for generating a temperature signal which corresponds to the temperature;



computing and controlling means for receiving the temperature signal and controlling the light source means in response to the temperature signal; and

support member means connected to the temperature sensing means for positioning the temperature sensor means in thermal contact with the disc cartridge when the disc cartridge is loaded into the recording and/or reproducing apparatus.

5,182,743

OPTICAL DISK ARRANGEMENT WITH DIFFRACTIVE TRACKS ALLOWING POSITIONAL CONTROL

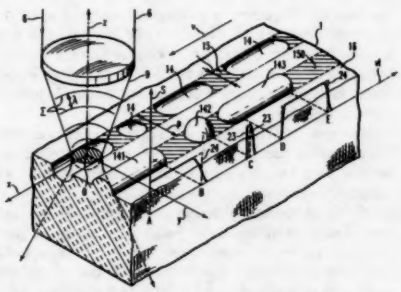
Claude Tinet, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 599,992, Oct. 19, 1990, Pat. No. 5,132,952, which is a continuation of Ser. No. 479,252, Feb. 13, 1990, Pat. No. 4,989,193, which is a continuation of Ser. No. 350,773, May 12, 1989, Pat. No. 5,016,235, which is a continuation of Ser. No. 213,097, Jun. 29, 1988, Pat. No. 4,856,108, which is a division of Ser. No. 96,317, Sep. 9, 1987, Pat. No. 4,868,808, which is a continuation of Ser. No. 925,491, Oct. 29, 1986, abandoned, which is a continuation of Ser. No. 667,100, Nov. 1, 1984, abandoned, which is a division of Ser. No. 545,110, Oct. 25, 1983, Pat. No. 4,491,940, which is a continuation of Ser. No. 108,499, Dec. 31, 1979, abandoned, which is a continuation of Ser. No. 793,270, May 3, 1977, abandoned, which is a continuation of Ser. No. 390,715, Aug. 23, 1973, abandoned. This application Nov. 19, 1991, Ser. No. 794,506

Claims priority, application France, Aug. 25, 1972, 72 30346

Int. Cl.[5] G11B *7/24*

U.S. Cl. 369—275.4 **2 Claims**



1. An optical readable carrier comprising:

a substrate with diffractive tracks having respective longitudinal axes and including at least longitudinal contours

substantially parallel to said respective axes, along which contours there is deviation from a reference surface of said substrate towards zones non-coplanar with said reference surface, each of said tracks having a width of at most 2 microns, said tracks being diffractive all along said longitudinal contours for providing diffraction of light of a light spot illuminating one of said tracks and substantially occupying the width of said one track, said contours of said one track providing said diffraction being such that the light emerging from the diffractive track has a spatial distribution representing an amount of track misregistration between the spot and the axis of said one track.

5,182,744

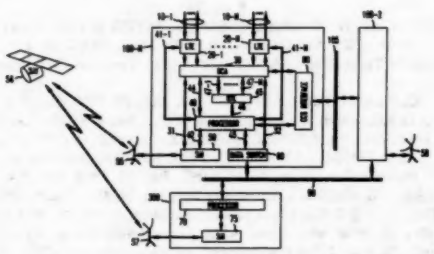
TELECOMMUNICATIONS NETWORK RESTORATION ARCHITECTURE

James D. Askew, Ellenwood, Ga.; Chin-Wang Chao, Lincroft, N.J.; David R. Cochran, Easton, Pa.; Peter M. Dollard, Highlands, N.J.; Hossein Eslambolchi, Freehold, N.J.; William E. Goodson, Freehold, N.J.; Robert P. Guenther, Red Bank, N.J.; Omar M. Mansour, West Long Branch, N.J.; Liem T. Nguyen, Colts Neck, N.J., and Sarma S. Tanuku, Howell, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 3, 1991, Ser. No. 637,244

Int. Cl.[5] H04J *1/16*

U.S. Cl. 370—16 **20 Claims**



11. A method of establishing an alternate traffic route in a communications network formed from a plurality of nodes interconnected by a plurality of transmission links, said method comprising the steps of

polling associated ones of said nodes and links for alarms indicative of at least a disruption in the flow of traffic through ones of said associated ones of said nodes and links,

responding to receipt of a particular one of said alarms at a rate which causes a predetermined threshold to be reached by outputting a message identifying at least said disruption and its location to one of a number of communications paths for delivery to a central control location,

responding to receipt of said message at said central control location by locating spare capacity contained in individual ones of said links,

establishing in real time from said spare capacity a number of orders of connectivity to route said degraded traffic around that one of said associated nodes or links which generated said one alarm condition, and

responding to receipt from said central control location via one of said communications paths of a message requesting a continuity test of a particular one of said orders of connectivity by monitoring said particular one of said associated ones of said nodes and links which generated said one alarm condition to verify said disruption, and then testing the continuity of said one order of connectivity to determine if said disrupted traffic may be transferred thereto.

5,182,745

DATA TRANSMISSION METHOD AND ARRANGEMENT

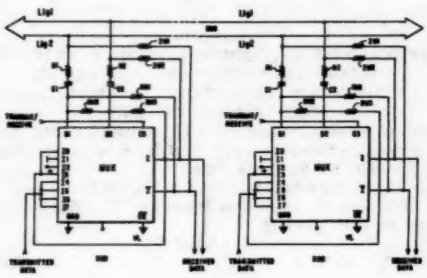
Johannes Heichler, Murrhardt, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Oct. 30, 1990, Ser. No. 605,488

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1989, 3937814

Int. Cl.[5] H04L *5/14*; H04J *3/02*

U.S. Cl. 370—85.1 **15 Claims**



1. A method of transmitting and receiving data which is in the form of difference signals, between subscribers which are in communication with one another via a data bus, comprising the steps of:

providing a multiplexer for each subscriber as a bus decoder for data evaluation with the multiplexer having select inputs, for receiving data, coupled to the lines of the data bus via d.c. blocking circuitry;

switching the multiplexer between transmit and receive modes of operation by means of a control signal;

during the receive mode of operation, decoding only different-mode-states of data on the bus as logic levels and using an immediately previously decoded logic level for a common mode state of data on the bus; and

establishing a d.c. bias voltage at the select inputs of the multiplexer during the receive mode of operation by a feed back hysteresis connection between outputs of the multiplexer and the select inputs.

5,182,746

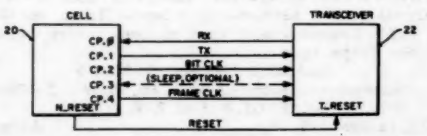
TRANSCEIVER INTERFACE

Amy O. Huribut, San Francisco; Glen M. Riley, Los Gatos, and Rod G. Sinks, Cupertino, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 28, 1991, Ser. No. 676,948

Int. Cl.[5] H04J *3/06*

U.S. Cl. 370—100.1 **16 Claims**



1. In a network node having an intelligent cell and a transceiver, the transceiver coupled to a communications medium for communicating with other nodes of the network, a method for exchanging information between the cell and the transceiver and transmitting information on the communications medium comprising the steps of:

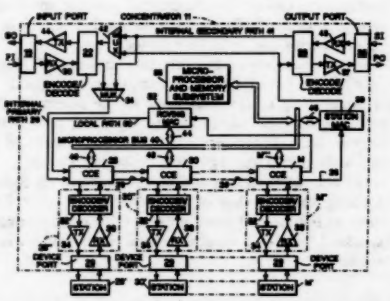
(a) supplying the transceiver with a bit clock generated by the cell;
(b) supplying the transceiver with a frame clock generated by the cell;
(c) transferring successive frames of transceiver-bound information from the cell to the transceiver during respective successive cycles of the frame clock;
(d) transferring successive frame of cell-bound information from the transceiver to the cell substantially concurrently with the transfer of corresponding frames of transceiver-bound information, wherein each frame of said transceiver-bound and cell-bound information both comprise a plurality of status bits and a plurality of data bits transferred in synchronism with the bit clock;
(e) transmitting the field of data bits of at least one frame of transceiver-bound information on the communications medium.

5,182,747

METHOD FOR CONTROLLING THE INSERTION OF STATIONS INTO FDDI NETWORK

James F. Frenzel, III, Bahama, and Brian A. Youngman, Cary, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1990, Ser. No. 543,893
Int. Cl.[5] H04J *3/16*
U.S. Cl. 370—85.5 **11 Claims**



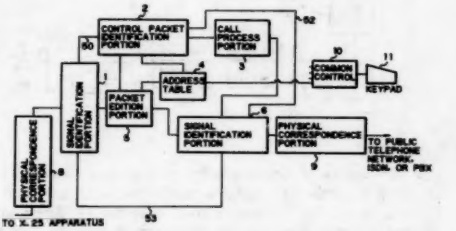
5. In a serial communications network having a communications media, a set of stations connected directly to the media, another set of stations connected to at least one multiport concentrator which, in turn, is connected to the media with communicating stations being arranged into a main serial loop with each communicating station allotted a fixed period of time (T1) within which it may transmit frames onto said network and at the end of the fixed period of time, appends a token to its transmission, said token being available for use by another station having frames to be transmitted onto said network; an improved method for controlling the insertion of stations into the network comprising the steps of:
(a) providing in said concentrator a local loop with a local token circulating thereon, said local loop including a concentrator configuration element, a Roving MAC and a station to be inserted in the main serial loop;
(b) allotting a second fixed period of time (T2) in which the station may transmit frames onto the local loop;
(c) capturing the local circulating token by said Roving MAC;
(d) monitoring the main serial loop by the concentrator configuration element;
(e) said concentrator configuration element selectively passing frames on said main serial loop to active downstream stations already in the main serial loop;
(f) said concentrator configuration element transmitting to an inserting station a main token appended to passed frames;
(g) correlating T1 and T2 in the inserting station;
(h) generating in the inserting station, a new main token rotation time to enable access to the main serial loop only if T2 is less than T1; and
(i) all stations on the main serial loop using the new main token rotation time of step (h) to enable access to the main serial loop.

5,182,748

PROTOCOL CONVERSION SYSTEM

Shigekazu Sakata, Saitama; Yasuo Ito, Tokyo; Kunio Ochiai, and Hisao Yamagata, both of Kanagawa, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1990, Ser. No. 599,786
Claims priority, application Japan, Oct. 20, 1989, 1-271874
Int. Cl.[5] H04J *3/12*
U.S. Cl. 370—94.1 **4 Claims**



1. A protocol conversion system (FIGS. 1, 2, 3, 4 and 8) coupled with an X.25 apparatus and one of networks including a telephone network, an ISDN network and a PBX network for allowing said X.25 apparatus to couple with another X.25 apparatus through one of said networks, comprising;
a first signal identification portion (1) coupled with said X.25 apparatus,
a second signal identification portion (6) coupled with one of said networks,
a control packet identification portion (2) coupled between said signal identification portions (1, 6),
a call process portion (3) coupled with said control packet identification portion (2) and said second signal identification portion (6),
an address table (4) and a packet edition portion (5) coupled with said control packet identification portion (2) and said signal identification portions (1, 6),
a common control (10) and a keypad (11) for common control and initialization of each of said elements, and
a direct path (53) coupling said signal identification portions (1, 6), wherein
each of said signal identification portions (1, 6) separates received packets into data packets and control packets, said data packets being forwarded to another signal identification portion (6, 1) through said direct path (53), and said control packets being forwarded to said control packet identification portion (2),
said call process portion (3) processes a dial signal for connection and disconnection, and
said address table (4) and said packet edition portion process address conversion of a control packet, and wherein
connection operation is carried out by control packets CR, CC, CN and CA between the present conversion system and said X.25 apparatus, and the packets for X.32 protocol between the present conversion system and one of said networks including address conversion of a packet,
data transfer is carried out by transferring a data packet through said direct path (53), and
disconnect operation is carried out by control packets CQ, CF, and CI between the X.25 apparatus and the present conversion system, and the packets for X.32 protocol

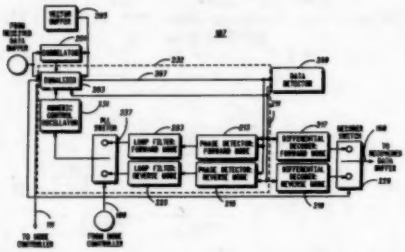
between the present conversion system and one of said networks.

5,182,749

RECEIVER FOR RECOVERING DATA IN A FORWARD AND REVERSE DIRECTION IN TIME

Henry L. Kazecki, Arlington Heights, and James C. Baker, Hanover Park, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 21, 1990, Ser. No. 633,556
Int. Cl.[5] H04J 3/06
U.S. Cl. 370—100.1 **21 Claims**



1. An apparatus for recovering at least one signal packet included in a serial data signal, wherein the packet is formed of multiple sequential symbols and at least one predetermined symbol, the at least one predetermined symbol having a predetermined position and value, said apparatus comprising:

means for receiving the serial data signal;

means for determining a direction in time of recovery for at least one symbol sequential to the at least one predetermined symbol;

means for recovering said at least one symbol in said determined direction;

means for changing between said determined direction and a second direction; and

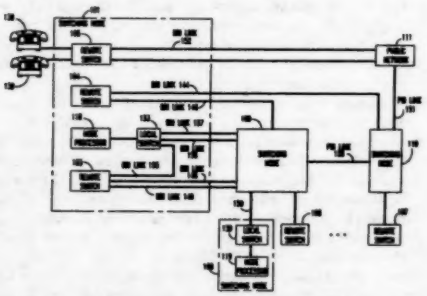
means for storing said at least one recovered symbol.

5,182,750

TRANSPARENT REMOTING OF SWITCHING NETWORK CONTROL OVER A STANDARD INTERFACE LINK

Bruce M. Bales, Louisville; Robert L. Crumpley, Westminster; Sandra S. North, Golden, and Stephen M. Thieler, Boulder, all of Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 31, 1990, Ser. No. 636,523
Int. Cl.[5] H04J 3/12
U.S. Cl. 370—110.1 **28 Claims**



1. An apparatus for controlling a remote switch by a central processor via a switching system interconnecting said remote switch and said central processor, said apparatus comprising:

means for establishing a transport path between said central processor and said remote switch by placing a call that is communicated through said switching system by said central processor and said remote switch each performing a plurality of hierarchical call control functions to initiate and maintain said call utilizing a standard protocol in conjuction with said switching system;

means in said remote switch for communicating signaling and control information for other calls on said remote switch to said central processor via said transport path after performing only the lowest ones of said plurality of hierarchical call control functions;

means in said central processor for performing remaining ones of said plurality of hierarchical call control functions on said communicated information to generate other signaling and control information and for communicating said other information to said lowest ones of said plurality of hierarchical call control functions in said remote switch, whereby said central processor controls said other calls on said remote switch;

means for detecting a failure of said call;

said establishing means responsive to said failure for establishing a second transport path between said central processor and said remote switch by placing a second call through said switching system by said central processor and said remote switch each performing said plurality of hierarchical call control functions to initiate and maintain said second call utilizing said standard protocol in conjunction with said switching system.

means for detecting an inability to establish calls between said remote switch and said central processor; and

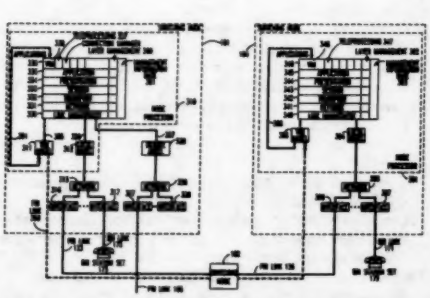
said establishing means responsive to the detection of said inability for establishing a third transport path between another central processor and said remote switch by placing a third call through said switching system by said other central processor and said remote switch each performing said plurality of hierarchical call control functions to initiate and maintain said third call utilizing said standard protocol in conjunction with said switching system.

5,182,751

SWITCHING SYSTEM USING IDENTICAL SWITCHING NODES

Bruce M. Bales, Louisville; Robert L. Crumpley, Westminster; Sandra S. North, Golden, and Stephen M. Thieler, Boulder, all of Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 31, 1990, Ser. No. 636,521
Int. Cl.[5] H04J 3/12
U.S. Cl. 370—110.1 **52 Claims**



1. An apparatus in a first and second switching nodes for

initiating an virtual link between said switching nodes through a switching system, comprising:

means for establishing a plurality of physical transport channels between said switching nodes through said switching system utilizing a standard protocol on a physical signaling channel;

means for establishing a virtual signaling channel and a plurality of virtual transport channels via said physical transport channels; and

means for identifying said virtual signaling channel and said plurality of virtual transport channels to said switching nodes allowing calls to be set up on said virtual transport channels using said standard protocol on said virtual signaling channel without said physical signaling channel and said switching system being involved with the call setup of said calls.

5,182,752

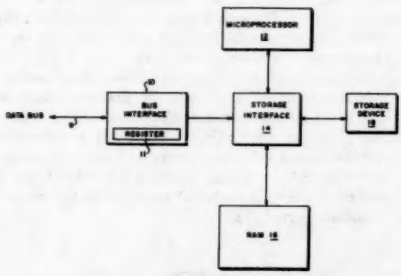
METHOD AND APPARATUS FOR TRANSFERRING DATA BETWEEN A DATA BUS AND A DATA STORAGE DEVICE

John E. DeRoo, Marlborough; Robert C. Frame, Westboro, and Ann Solli, Framingham, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 29, 1990, Ser. No. 545,860

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—37.7 **16 Claims**



1. A data transmission system for transmitting data between a data bus, which transmits data in the form of multi-byte packets that include a plurality of data bytes and associated parity bits and a packet check sum symbol, and a data storage device, the system comprising:

A. a microprocessor for controlling a data transfer operation;

B. a bus interface which includes

i. receiving means for receiving data from the data bus,

ii. byte parity check means for detecting errors in received data bytes using received parity bits,

iii. converter means for converting the data bytes to data words and associating with each data word a predetermined number of parity bits,

iv. word parity check means for detecting errors in the data words using the associated parity bits,

v. encoder/decoder means for encoding a predetermined number of data words and generating error detection symbols,

vi. check sum error detecting means for detecting errors in a received multi-byte packet using the received packet check sum symbol,

the bus interface asserting an error signal, interrupting the microprocessor and stopping a data transmission operation whenever it detects an error;

C. buffer means for receiving from the bus interface data in groups containing a predetermined number of data words and associated error detection symbols and storing each group in a designated buffer;

D. a storage interface for retrieving the data groups one at a time from the buffer means and encoding the retrieved data, using an error correction code, to generate error correction symbols; and

E. a storage device for receiving the data and error correction symbols from the storage interface and storing the data and the error correction symbols in a storage unit on a storage medium.

5,182,753

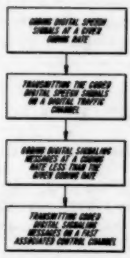
METHOD OF TRANSMITTING SIGNALING MESSAGES IN A MOBILE RADIO COMMUNICATION SYSTEM

Jan E. A. S. Dahlin, Järfälla, and Krister A. Raith, Kista, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation of Ser. No. 497,517, Mar. 20, 1990, abandoned. This application Jun. 15, 1992, Ser. No. 899,166

Int. Cl.[5] G06F *11/10*

U.S. Cl. 371—43 **12 Claims**



1. A method of transmitting signaling messages on a fast associated control channel belonging to a digital traffic channel in a mobile radio communication system, comprising the steps of:

coding digital speech signals at a given coding rate to produce coded digital speech signals;

transmitting said coded digital speech signals on said digital traffic channel;

coding digital signaling messages at a coding rate less than said given coding rate to produce coded digital signaling messages with more data redundancy than said coded digital speech signals; and

transmitting coded digital signaling messages on said fast associated control channel belonging to said digital traffic channel.

5,182,754

MICROPROCESSOR HAVING IMPROVED FUNCTIONAL REDUNDANCY MONITOR MODE ARRANGEMENT

Yasuhiko Koumoto, and Koji Maemura, both of Tokyo, Japan, assignors to NEC Corporation

Filed Feb. 9, 1990, Ser. No. 477,051

Claims priority, application Japan, Feb. 9, 1989, 1-31458

Int. Cl.[5] G06F *15/16, 7/02*

U.S. Cl. 371—68.3 **3 Claims**

1. A microprocessor comprising:

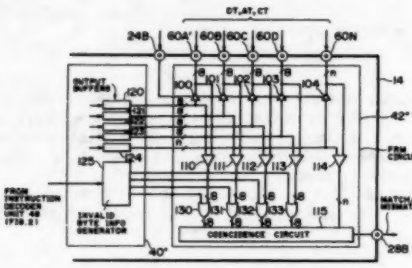
a plurality of output drivers for outputting contents of a plurality of corresponding output buffers by way of a plurality of terminals during a normal mode and for blocking the outputs of said plurality of output buffers to said plurality of terminals during a monitor mode;

a plurality of comparators coupled to said plurality of output buffers and said plurality of terminals, said plurality of comparators being arranged to compare signals appearing on said terminals and the outputs of said output buffers in said monitor mode;

a coincidence circuit;

an invalid byte information generator coupled to said coinci-

dence circuit by way of a plurality of logic gates, said plurality of logic gates being coupled between said comparators and said coincidence circuit, said invalid byte



information generator and said plurality of logic gates defining masking means for preventing the output of an erroneous mismatch signal from said coincidence circuit.

5,182,755

MALFUNCTION CHECKING SYSTEM FOR CONTROLLER

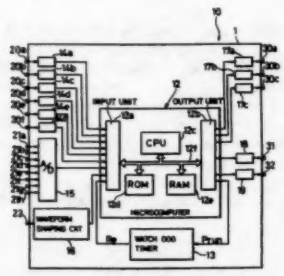
Akira Sekiguchi; Masao Nakajima; Kazumasa Kurihara, and Kenji Arai, all of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,962

Claims priority, application Japan, Jun. 19, 1987, 62-151456; Jul. 14, 1987, 62-173877

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—16.3 **11 Claims**



1. A system for checking a malfunction in a controller, comprising:

(a) a microcomputer, said microcomputer comprising means for performing a normal control mode, means for performing a self-checking mode, and means for judging whether the normal control mode or the self-checking mode is to be performed;

(b) a reset means being connected to said microcomputer;

said reset means refraining from outputting a reset signal during the time when said reset means is being supplied with a program run signal from said microcomputer; said reset means outputting said reset signal to said microcomputer so as to reset said microcomputer when said reset means does not receive said program run signal for a predetermined period of time; said normal mode performing means of said microcomputer including means for outputting said program run signal; said self-checking mode performing means including means for maintaining a no-operation condition at a final stage so as to wait for the reset signal from said reset means; and each time said microcomputer is reset in response to the reset signal said judging means first judges whether the normal control mode or the self-checking mode is to be performed.

5,182,756

SEMICONDUCTOR LASER DRIVE APPARATUS

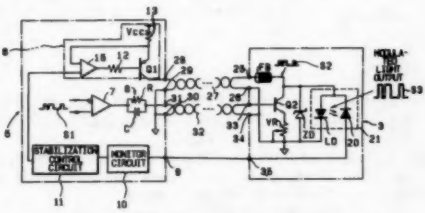
Michio Waki, and Shinzo Takada, both of Tokyo, Japan, assignors to Kabushiki Kaisha TOPCON, Japan

Filed Jan. 18, 1991, Ser. No. 643,112

Claims priority, application Japan, Jan. 25, 1990, 2-13711

Int. Cl.[5] H01S *3/00*

U.S. Cl. 372—38 **20 Claims**



1. A semiconductor laser drive apparatus comprising:

a semiconductor laser source (LD) for generating a laser light;

a switching means (Q2) for supplying the semiconductor laser source (LD) with a first modulated signal (S2) for driving the semiconductor laser source (LD) on the basis of a second modulated signal (S1);

a current source (6) for supplying the switching means (Q2) with a current for producing the first modulated signal (S2) in the switching means (Q2); and

a base adjusting means (VR) operatively positioned with respect to said switching means and said semiconductor laser source for adjusting a bias direct-current (IB) to be applied to the semiconductor laser source to bias the first modulated signal (S2).

5,182,757

SURFACE EMISSION TYPE SEMICONDUCTOR LASER

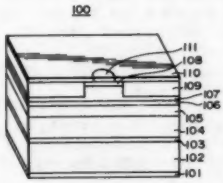
Katsumi Mori; Tatsuya Asaka, and Hideaki Iwano, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Sep. 9, 1991, Ser. No. 756,981

Claims priority, application Japan, Sep. 12, 1990, 2-242000

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 **18 Claims**

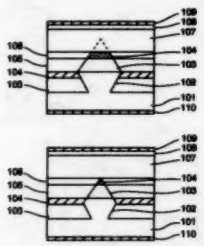


1. A surface emission type semiconductor laser for emitting a laser beam in a direction perpendicular to a semiconductor substrate in which said laser is formed, comprising an optical resonator means including a pair of reflecting mirrors having different reflectivities and a plurality of semiconductor layers between said reflecting mirrors, the semiconductor layers including at least a cladding layer in said semiconductor layers being formed into at least one column-like portion, and a II–VI group compound semiconductor epitaxial layer surrounding said at least one column-like portion.

5,182,758
PERIODIC GAIN-TYPE SEMICONDUCTOR LASER DEVICE

Mototaka Taneya; Fumihiro Konushi, both of Nara; Toshiyuki Okumura, Tenri, and Haruhisa Takiguchi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 4, 1991, Ser. No. 802,118
Claims priority, application Japan, Dec. 4, 1990, 2-400341
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—46 **5 Claims**



1. A periodic gain-type semiconductor laser device for emitting light, said device comprising:

a (100) semiconductor substrate of a first conductivity type;

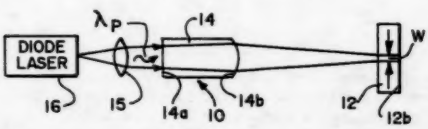
a mesa stripe formed in the [011] direction on said (100) semiconductor substrate, said mesa stripe having a top surface, said top surface including wide portions and narrow portions, said wide portions and narrow portions being arranged alternately with a period, said period being an integral multiple of the half-wavelength of the emitted light; and

a multilayer structure formed on said mesa stripe, said multilayer structure including: a first cladding layer of the first conductivity type formed on said top surface of said mesa stripe; and an active layer formed on a top surface of said first cladding layer, said multilayer structure comprising first portions formed on said wide portions of said top surface of said mesa stripe and second portions formed on said narrow portions of said top surface of said mesa stripe.

5,182,759
APPARATUS AND METHOD FOR PUMPING OF A WEAKLY ABSORBING LASANT MATERIAL

Douglas W. Anthon; John H. Clark, both of Wheaton, Ill.; Leo Johnson, Bedminster, N.J., and Timothy J. Pier, Kenosha, Wis., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 551,569, Jul. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 523,991, May 16, 1990, abandoned. This application Sep. 17, 1991, Ser. No. 761,279
Int. Cl.[5] H01S 3/093
U.S. Cl. 372—72 **35 Claims**



1. A laser apparatus, comprising:

a) a first laser cavity;

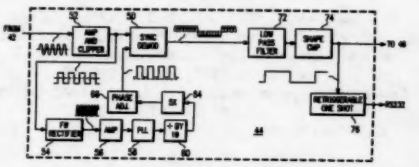
b) a first lasant material which is located in said first laser cavity to produce optical radiation at least at a primary laser wavelength; and

c) a second lasant material which is optically pumped by said optical radiation from said first lasant material, which absorbs optical radiation at said primary laser wavelength in an amount to achieve Optimum Output Coupling to said optical radiation from said first lasant material, which is at least partially located in said first laser cavity, which functions as the output coupler of said first laser cavity, and which lases at a secondary laser wavelength, said second lasant material being selected to have sufficiently low excited-state absorption losses at said primary wavelength such that there is a net gain in said first laser cavity.

5,182,760
DEMODULATION SYSTEM FOR PHASE SHIFT KEYED MODULATED DATA TRANSMISSION

Melvin G. Montgomery, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 26, 1990, Ser. No. 633,977
Int. Cl.[5] H04L 27/22
U.S. Cl. 375—52 **20 Claims**



1. A phase shift keyed demodulator circuit, comprising:

a demodulator having a first input for receiving an input signal and a second input for receiving a reference signal, for presenting a signal at its output corresponding to the phase difference between the signals received at its input;

a reference signal generating circuit, having an input receiving said input signal, and having its output coupled to said second input of said demodulator, comprising:

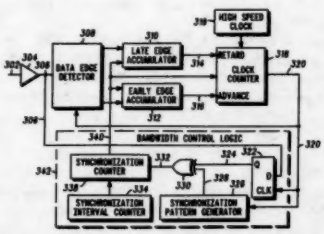
a frequency divider circuit having an input coupled to said input of said generating circuit, for generating at its output a periodic signal at a period which is an integral multiple of the period of said input signal; and

a frequency multiplier, having an input coupled to the output of said frequency divider, having an output coupled to said second input of said demodulator, for generating at its output a periodic signal at a frequency which is an integral multiple of the frequency of the signal at the output of said frequency divider.

5,182,761
DATA TRANSMISSION SYSTEM RECEIVER HAVING PHASE-INDEPENDENT BANDWIDTH CONTROL

Donald R. Beyer, Bartlett; Matthew R. Miller, and Krsman Martinovich, both of Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 31, 1991, Ser. No. 649,083
Int. Cl.[5] H03D 3/24
U.S. Cl. 375—119 **4 Claims**



1. A data receiver having a phase lock-circuit for producing

a phase-adjusted clock signal, the phase-lock circuit having as its inputs the phase-adjusted clock signal and a formatted data stream being received at a predetermined data rate, the phase-lock circuit operating in one of at least a first bandwidth mode and a second bandwidth mode, the formatted data stream including a periodic synchronization pattern interposed among data segments, the data receiver comprising:

means, coupled to the phase-adjusted clock signal, for sampling the data stream to produce a recovered data signal;

means, coupled to the phase adjusted clock signal, for generating a predetermined synchronization pattern to produce a reference synchronization pattern;

means for comparing the recovered data signal with said reference synchronization pattern to produce a synchronization value; and

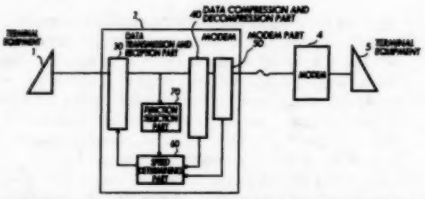
means, coupled to said means for comparing, for switching the phase-lock circuit between the first bandwidth mode and the second bandwidth mode.

5,182,762

MODEM HAVING SPEED NOTIFYING MEANS

Nobuo Shirai, Hino, and Takami Kasasaku, Tokyo, both of Japan, assignors to Fujitsu Limited, Japan

Filed Jan. 31, 1991, Ser. No. 648,999
Claims priority, application Japan, Jan. 31, 1990, 2-18885
Int. Cl.[5] H04B *1/66*
U.S. Cl. 375—122 **8 Claims**



8. A speed adapter apparatus for changing a communication speed of a communication having compressed data between a modem and terminal equipment based on a compressed communication between the modem and an other modem, said speed adapter apparatus comprising:

detecting means for detecting a modem communication speed and a compression rate used between the modem and the other modem;

speed determining means for determining an optimum communication speed based on the modem communication speed and the compression rate received from said detecting means; and

speed setting means for setting the communication speed used between the modem and the terminal equipment to the optimum communication speed received from said speed determining means.

5,182,763

REFLECTION DEVICE

Takashi Iizuka, Atsugi; Yutaka Watanabe, Isehara, and Yasuaki Fukuda, Hadano, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 767,364, Sep. 30, 1991, abandoned, which is a continuation of Ser. No. 633,957, Dec. 26, 1990, abandoned. This application May 26, 1992, Ser. No. 888,275
Claims priority, application Japan, Dec. 28, 1989, 1-344842
Int. Cl.[5] G21K *5/10*
U.S. Cl. 378—34 **32 Claims**

1. An X-ray exposure apparatus, comprising:

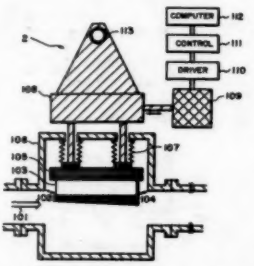
an X-ray source; and

an illumination system for illuminating a mask pattern with X-rays from said X-ray source to expose a wafer to the mask pattern;

wherein said illumination system includes a reflection mirror for reflecting the X-rays from said X-ray source to produce a reflection beam and a driving device for swinging said reflection mirror;

wherein said reflection mirror has a reflection surface disposed so that the X-rays are grazingly inputted thereto;

wherein said reflection surface has a multilayered film effective to provide an increased relative reflectivity with respect to a predetermined wavelength of the reflection beam;



wherein each layer of said multilayered film of said reflection mirror has a thickness which gradually increases with an increase in a distance from said radiation beam in a plane of incidence of the X-rays; and

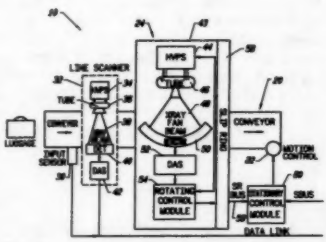
wherein said driving device swings said reflection mirror so as to shift a position and an angle of incidence of the X-rays upon said reflection mirror in the plane of incidence, to thereby scanningly deflect the reflection beam to scan the mask pattern with the deflected reflection beam.

5,182,764

AUTOMATIC CONCEALED OBJECT DETECTION SYSTEM HAVING A PRE-SCAN STAGE

Kristian R. Peschmann, and Jonathan Harmann, both of San Francisco, Calif., assignors to Invision Technologies, Inc., Foster City, Calif.

Filed Oct. 3, 1991, Ser. No. 770,552
Int. Cl.[5] G01N *23/04*
U.S. Cl. 378—57 **34 Claims**



23. A method of automatically detecting a target object within a container, said method comprising the steps of:

prescanning said container to form prescan data;

determining selected locations for CT scanning of said container, said determining step relying upon said prescan data;

CT scanning said container at said selected locations to form CT data; and

identifying automatically said target object within said CT data, said identifying step relying upon said CT data from said scanning step.

5,182,765
SPEECH RECOGNITION SYSTEM WITH AN ACCURATE RECOGNITION FUNCTION

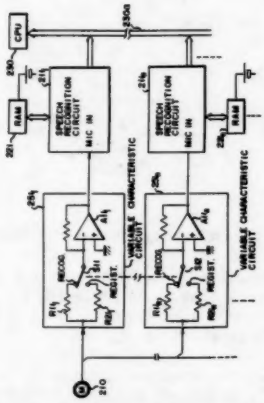
Takaaki Ishii, Sagamihara, and Toru Kuge, Hino, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 601,013, Oct. 24, 1990, abandoned, which is a continuation of Ser. No. 382,346, Jul. 20, 1989, abandoned, which is a continuation of Ser. No. 933,213, Nov. 21, 1986, Pat. No. 4,873,714. This application Jan. 24, 1992, Ser. No. 825,421

Claims priority, application Japan, Nov. 26, 1985, 60-181654[U]; Nov. 26, 1985, 60-265502; Dec. 20, 1985, 60-287434

Int. Cl.[5] G10L *9/08*; H04M *1/30*

U.S. Cl. 379—88 **1 Claim**



1. A speech recognition system comprising:

microphone means for producing speech input signals of various users, to be registered or recognized;

speech recognition and registration means responsive to a speech input signal from the microphone means, so as to subject the speech input signal to either a registration or a recognition processing, in which upon the registration processing, the speech input signal is allowed to be stored as recognition data and upon the recognition processing, the speech input signal is compared to the recognition data which has been stored; and

a central processing unit which performs speech recognition processing based on the results of comparison; wherein said speech recognition and registration means comprises a plurality of speech recognition circuits which are connected between a corresponding number of variable characteristic circuits and speech registration RAM's respectively where a plurality of modified speech patterns are stored for each word or each clause, said modified speech patterns including, as the characteristics of the speech, the magnitudes of sound volumes, the varying lengths of sounds, the variation of sound intervals, the husky or somewhat masked voices, and

each of said variable characteristic circuits is comprised of an amplifier of a different amplification factor and different bandpath characteristic, a set of resistors and a mode designating switch, respectively, to allow the speech which is input through said microphone means in a speech registration mode to be prepared as a variation pattern so that it is stored as such in the speech registration RAM of the corresponding speech recognition circuit, such that when a user inputs his speech through said microphone means it is supplied respectively through said variable characteristic circuits to said speech recognition circuits where the input speeches are compared to the speech patterns which have been registered in the respective speech registration RAMs.

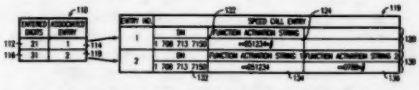
5,182,766
GENERALIZED TELECOMMUNICATIONS CUSTOMER SIGNALING ARRANGEMENT

Stuart M. Garland, Morton Grove, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 19, 1990, Ser. No. 629,891

Int. Cl.[5] H04M *3/42, 1/00*

U.S. Cl. 379—216 **36 Claims**



1. In a telecommunications switch, a method of interpreting a substring of characters to said telecommunications switch comprising the steps of:

a. interpreting initial characters of a substring as a function type;

b. interpreting subsequent characters of the substring as one or more function parameters for function types of a class requiring parameters; and

c. interpreting a predefined delimiter character substring as the end of a function call;

whereby a substring of characters is interpreted as a function call.

5,182,767
ELECTRONIC TELEPHONE DEVICE

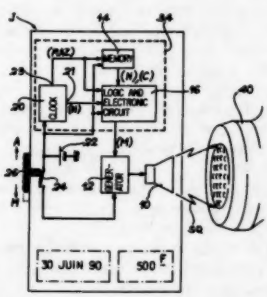
Alain Bernard, 5 rue Jules Simon, 75015 Paris, France

Filed Apr. 4, 1991, Ser. No. 680,551

Claims priority, application France, Apr. 5, 1990, 90 04367

Int. Cl.[5] H04M *1/26*

U.S. Cl. 379—355 **8 Claims**



1. Electronic device for a telephone system, comprising:

an acoustic transmitter;

an acoustic generator for controlling the acoustic transmitter and able to generate tones falling within the telephone band;

a digital message generation means for generating a digital message which consists of a set of numbers, wherein said set of numbers changes on each use of said electronic device, and wherein said digital message generation means includes means to determine a time limitation moment, said digital message generation means comprising:

a memory containing a first identification code and a second code of a service key linked to the telephone system in which the device is used;

an electronic and logic circuit connected to the memory, for delivering a message controlling the generator, this message depending on the first and second codes, wherein each number of the message controls the generator so as

to have the acoustic transmitter transmit a particular sequence of tones;

a battery able to power the device; and

a manually controlled switch able to put the acoustic generator into service so as to transmit the sequence of tones.

5,182,768

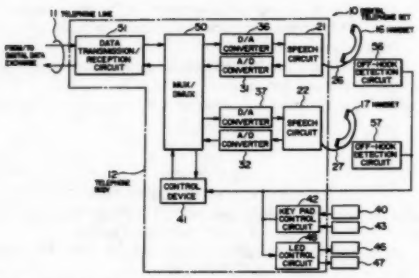
DIGITAL TELEPHONE SET CAPABLE OF BEING SIMULTANEOUSLY USED BY A PLURALITY OF PERSONS BY USING ONE TRANSMISSION LINE

Yuji Nakano, and Fumikazu Hamatani, both of Kawasaki, Japan, assignors to Nitsuko Corporation, Kawasaki, Japan

Filed Oct. 21, 1991, Ser. No. 780,018

Int. Cl.[5] H04M *1/02, 1/72, 9/02, 13/00*

U.S. Cl. 379—387 **3 Claims**



1. A digital telephone set connected to a digital data exchange through a transmission line, said digital data exchange being able to transmit/receive, through said transmission line, a time division multiplexed signal into which a plurality of digital speech signals are multiplexed in a time division fashion, said digital telephone set comprising:

a telephone body;

a plurality of handsets mounted on said telephone body for converting input sounds into input analog speech signals and for converting output analog speech signals into output sounds;

a plurality of analog-to-digital converters connected to said handsets for converting said input analog speech signals into input digital speech signals;

a plurality of digital-to-analog converters connected to said handsets for converting output digital speech signals into said output analog speech signals;

a set of dialling keys mounted on said telephone body for producing a numerical signal;

a control device connected to said dialling keys for producing input control data in response to said numerical signal and for producing an output control signal in response to output control data; and

a multiplexing/demultiplexing circuit connected to said transmission line, said control device, said analog-to-digital converters, and said digital-to-analog converters for transmitting/receiving transmission/reception time division multiplexed signals to/from said digital data exchange through said transmission line, said multiplexing-/demultiplexing circuit being for multiplexing said input digital speech signals and said input control data into said transmission time division multiplexed signal and for demultiplexing said reception time division multiplexed signal into said output digital speech signals and said output control data.

5,182,769

TELEPHONE SET HAVING A VOLATILE MEMORY

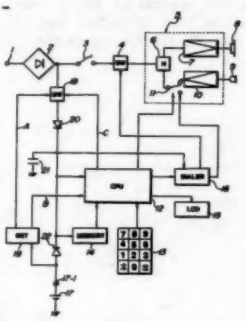
Kentoku Yamaguchi, and Kenichi Sato, both of Hino, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 18, 1990, Ser. No. 598,401

Claims priority, application Japan, Oct. 19, 1989, 1-272565; Nov. 13, 1989, 1-294374

Int. Cl.[5] H04M *1/00*

U.S. Cl. 379—387 **5 Claims**



1. A telephone set having a data storing function, comprising:

volatile storage means for storing various user data;

storage battery means for supplying a backup power source to the volatile storage means in order to hold the data stored in the volatile storage means;

detection means for detecting a residual amount of power of the storage battery means, said detection means having a timer for measuring an accumulated use o time of the storage battery means;

telephone office power supply extracting means for extracting a telephone office power source supplied from a telephone office side through a line;

changeover means, when the time measured by the timer reaches a preset value for changing the source o power supplied from the storage battery means to the volatile storage means over to the source of power supplied from the telephone office power source extracted by the telephone office power source extracting means to the volatile storage means; and

informing means for informing a fact that the residual amount of power of the storage battery means has dropped to the level below the preset value.

5,182,770

SYSTEM AND APPARATUS FOR PROTECTING COMPUTER SOFTWARE

Geza Medveczky, 5395 Greenrich Rd., Castro Valley, Calif. 94552, and Kelvin Lunsford, 36156 Bayonne Dr., Newark, Calif. 94560

Filed Apr. 19, 1991, Ser. No. 688,165

Int. Cl.[5] H04L *9/00*; H04K *1/00, 9/00*

U.S. Cl. 380—4 **17 Claims**

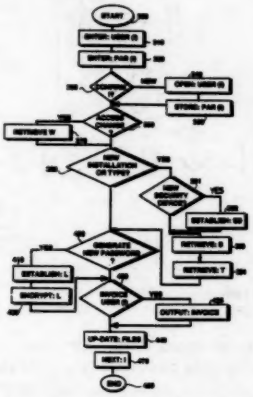
1. In a data processor, an integrated system for the prevention of unauthorized access to select programming, said integrated system comprising:

a) means for non-volatile storage of application control parameters including a decryption value and a program identification code;

b) means for receiving an unconfirmed system identification code in an encrypted form, wherein said unconfirmed system identification code corresponds to an unconfirmed program identification code and an unconfirmed installation identification code;

c) means for decrypting and storing said encrypted unconfirmed system identification code;

d) means for storing an installation identification code including logic control means and code transformation means connected to a peripheral port of said data processor;



e) means for accessing said stored installation identification code in encrypted form and decrypting said stored installation identification code; and

f) means for confirming whether the unconfirmed system identification code conforms with the stored installation identification code and the stored program identification code.

5,182,771

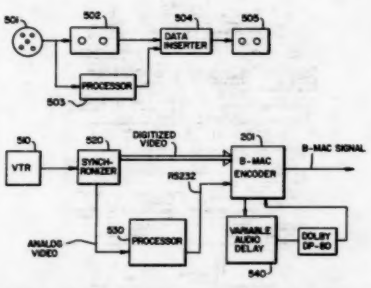
ANTI-TAPING METHOD AND APPARATUS FOR A MULTIPLEXED ANALOG COMPONENT TELEVISION SYSTEM

Randy Munich, Ontario, Canada; David Ewing, New South Wales, Australia; Tsai Lo, Ontario, Canada; Wayne Sheldrick, Ontario, Canada, and Baldwin Chieh, Ontario, all of Canada, assignors to Scientific Atlanta, Inc., Atlanta, Ga.

Filed Mar. 29, 1991, Ser. No. 677,236

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—5 **4 Claims**



1. An apparatus for generating a multiplexed analog component video signal, comprising:

storing means for storing luminance and chrominance information of lines of an input video signal;

a write/read control circuit for controlling writing of the luminance and chrominance information to said storing means and the reading of the luminance and chrominance information from said storing means, said write/read control circuit selectively reading the luminance and chrominance information from said storing means at a rate which is different than a rate at which the luminance and chrominance information is written to said storing means to vary a number of lines per field of the input video signal;

first means for respectively compressing the luminance and chrominance information read from said storing means and generating a multiplexed analog component video signal and said first means including means for providing information present on at least one predetermined line of the input video signal to the same predetermined line of the multiplexed analog video signal even if the number of lines per field is varied in accordance with said write/read control circuit.

5,182,772

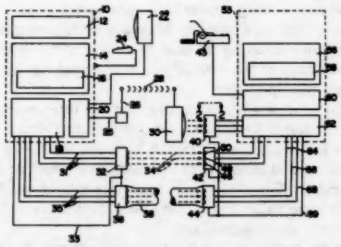
METHOD AND APPARATUS FOR ENCODING, TRANSMITTING, RECEIVING AND DE-CODING INFORMATION

Christopher R. Karas, 9545 E. D Ave. Apt. 6, Richland, Mich. 49083, and Carl B. Hoch, III, 4255 Alpenhorn, Apt. 9, Comstock Park, Mich. 49321, assignors to Christopher R. Karas and Carl B. Hoch, III

Filed Mar. 11, 1991, Ser. No. 667,176

Int. Cl.[5] H04K *1/00*

U.S. Cl. 380—49 **12 Claims**



1. The process of disseminating information which comprises the steps of:

establishing a dictionary of items including letters, numerals, symbols, and words to be disseminated,

equating each item of the dictionary to a different numerical code number,

impressing the items and equated code numbers into memories of sending and receiving computers,

impressing a color table of plural colors into memories of said sending and receiving computers,

programming the sending computer to sequentially convert items of information to numerical code numbers, and sequentially convert each digit of each selected numerical code number to a binary code group using the binary code groups to control pre-determined light sources as defined in the color table to produce light pulses,

transmitting the light pulses to a receiving station and using color filters to separate light components and activate photoconductors to receive the binary code groups sent,

converting the binary code groups to the equivalent numerical code numbers and further converting the numerical code numbers to the equated items of the dictionary in the memory of the receiving computer,

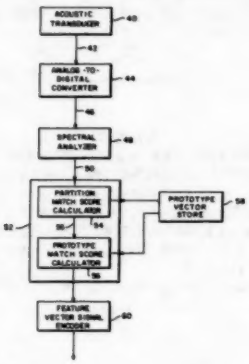
sequentially storing the received items as a clear message to a physical storage device,

and then sequentially reporting the received items as a clear message to a physical output device.

5,182,773
SPEAKER-INDEPENDENT LABEL CODING APPARATUS

Lalit R. Bahl, Amawalk; Michael A. Picheny; David Nahamoo, both of White Plains, and Peter V. de Souza, Mahopac, all of N.Y., assignors to International Business Machines Corporation, Yorktown Heights, N.Y.

Filed Mar. 22, 1991, Ser. No. 673,810
Int. Cl.[5] G10L *7/00, 7/08*
U.S. Cl. 381—41 **76 Claims**



1. A speech coding apparatus comprising:

means for storing a plurality of classes each having an identifier represented by at least two of a plurality of prototypes, each of the plurality of prototypes having at least one prototype value;

transducer means for extracting from an utterance a feature vector signal having at least one feature value;

means for establishing a match between the feature vector signal and at least one of the classes by selecting from the plurality of prototypes at least one prototype having a prototype value that best matches the feature value of the feature vector signal; and

means for coding the feature vector signal with the identifier of the class represented by the selected at least one prototype vector.

5,182,774
NOISE CANCELLATION HEADSET

Terrance R. Bourk, San Diego, Calif., assignor to Telex Communications, Inc., Minneapolis, Minn.

Filed Jul. 20, 1990, Ser. No. 555,990
Int. Cl.[5] A61F *11/06;* H04R *1/10, 25/00;* H04M *1/00*
U.S. Cl. 381—71 **23 Claims**

1. A headset for acoustic reproduction of an electronic anti-noise signal, the headset comprising:

a headband;

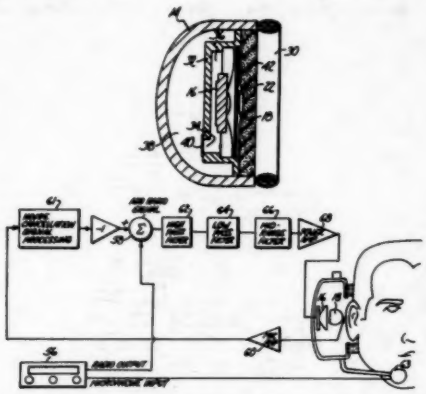
a cup, mounted to the headband;

a driver mounted within the cup, which receives and acoustically reproduces the electronic signal;

a microphone, having a directional sensing surface which detects and transduces acoustic pressure within the cup to a corresponding microphone electrical signal;

means for generating the anti-noise signal from the microphone signal; and

portioning means for mounting the microphone to the cup and for centering the microphone over the driver with the directional sensing surface oriented substantially directly toward the driver the positioning means comprising a

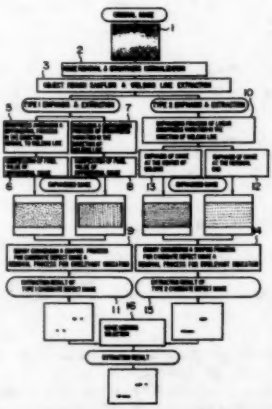


grille plate mounted to the cup across the driver, the microphone being mounted to the grille plate.

5,182,775
METHOD OF PROCESSING RADIOGRAPHIC IMAGE DATA FOR DETECTING A WELDING DEFECT

Shigetomo Matsui, Higashiosaka; Masahiro Uenishi, Akashi; Sadao Iuchi, Himeji; Kouji Sugimoto; Kouyu Itoga, both of Kobe; Tetsuzo Harada, Akashi; Kouji Michiba, Kobe; Katsuhiro Onda, and Takaaki Okumura, both of Nagoya, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe and The Chubu Electric Power Co., Inc., Aichi, both of, Japan

Filed Jan. 11, 1991, Ser. No. 639,872
Claims priority, application Japan, Jan. 12, 1990, 2-003508; Jan. 12, 1990, 2-003509
Int. Cl.[5] G06K *9/00;* G01N *23/02*
U.S. Cl. 382—8 **9 Claims**



1. A method of processing radiographic image data comprising:

forming a radiographic image of a welded portion including a welding line;

digitizing the radiographic image to form image data;

performing a first differential process on the image data to obtain first differential image data corresponding to a volumetric defect image in the radiographic image;

calculating a first threshold;

extracting pixels having a brightness less than the first threshold from the first differential image data to obtain first candidate defect image data;

performing a second differential process on the image data to obtain second differential image data corresponding to a planar defect image in the radiographic image;

calculating a second threshold;

extracting pixels having a brightness less than the second threshold from the second differential image data to obtain second candidate defect image data;

merging the first and second candidate defect image data to obtain merged image data; and

displaying the merged image data.

5,182,776

IMAGE PROCESSING APPARATUS HAVING APPARATUS FOR CORRECTING THE IMAGE PROCESSING

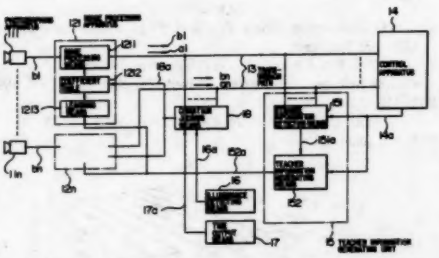
Masato Suzuki, Ibaraki; Hiromi Inaba, Katsuta; Hiroshi Takenaga, Ibaraki; Masachika Yamazaki, Katsuta; Naoto Oonuma, Hitachi; Kiyoshi Nakamura, Katsuta; Yoshio Sakai, Ibaraki; Kenji Yoneda, Katsuta; Naofumi Nakata, Katsuta, and Syoji Kasai, Katsuta, all of Japan, assignors to Hitachi, Ltd., Chiyoda, Japan

Filed Mar. 4, 1991, Ser. No. 664,319

Claims priority, application Japan, Mar. 2, 1990, 2-049311; Mar. 14, 1990, 2-061287

Int. Cl.[5] G06K *9/62*

U.S. Cl. 382—14 **28 Claims**



1. An image processing apparatus wherein image information is inputted to image processing means which performs an image processing on said image information based on a predetermined image processing algorithm, comprising:

means for generating teacher information related to a result of said image processing from said image processing means; and

means for correcting either said image processing algorithm, or a parameter thereof based upon said teacher information;

wherein said image processing means includes means, supplied with said image information, for performing an image processing to recognize the number of an object, and said teacher information generating means includes means for detecting a weighted value of said object, and means for computing teacher information related to the number of an object based on the detected weighted value.

5,182,777

METHOD FOR EXTRACTING FEATURE QUANTITIES OF A CHARACTER

Hiroshi Nakayama, Yokohama; Keiji Kojima, Kawasaki, and Gen Sato, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

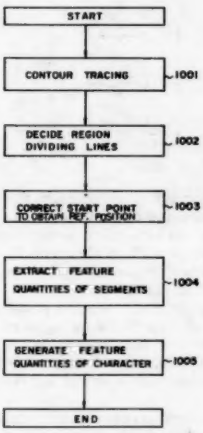
Continuation of Ser. No. 191,608, May 6, 1988

This application Apr. 26, 1991, Ser. No. 690,333

Claims priority, application Japan, May 8, 1987, 62-111765; May 8, 1987, 62-111766; May 8, 1987, 62-111767; May 30, 1987, 62-135396; Jun. 3, 1987, 62-139109; Apr. 1, 1988, 63-80949

Int. Cl.[5] G06K *9/34, 9/46, 9/48, 9/66*

U.S. Cl. 382—18 **20 Claims**



3. A method of extracting feature quantities of a character including the steps of:

optically scanning a character to be recognized to thereby generate a binary-valued character image;

extracting feature information from a contour pattern of said binary-valued character image;

extracting feature quantities of said character from said feature information by using information on dividing lines for dividing said binary-valued character image into a plurality of portions, characterized by comprising:

tracing said contour portion of said binary-valued character image to thereby generate feature information on said contour portion;

setting a first region dividing line at a first position within the width of said contour portion viewed from an end of a circumscribed rectangular region to which said binary-valued character image is circumscribed;

setting a second region dividing line at a second position within the width of said contour portion viewed from an opposite end of said circumscribed rectangular region, said first and said second region dividing lines being used for extracting feature quantities of said character;

detecting intersection position where each of said first and second region dividing lines intersects said contour portion;

equally dividing said feature information on said contour portion into a plurality of partitioned feature information sequences with respect to a reference position which is one of said intersecting positions; and

extracting feature quantities of said character from said feature information on said contour portion by using information on said intersecting positions, from each of said partitioned feature information sequences whereby said feature quantities are used to recognize said character.

5,182,778

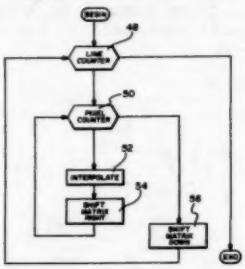
DOT-MATRIX VIDEO ENHANCEMENT FOR OPTICAL CHARACTER RECOGNITION

Peter Rudak, Hilton, and George A. Hadgis, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 31, 1990, Ser. No. 575,715

Int. Cl.[5] G06K *9/40*

U.S. Cl. 382—54 **5 Claims**



1. A method for use in an apparatus for improving optical character recognition of printed draft quality dot-matrix characters of an image to be scanned, comprising the steps of:

scanning an image with an electronic scanning device and generating signals representing the scanned image as rows and columns of pixels;

sending the signals of the scanned image to a binary digital filter that performs the following steps;

locating kernel of a first integer, M, M pixel rows and a second integer, N, N pixel columns in particular position in said scanned image where M and N are integers greater than two;

modifying the scanned image by moving said kernel between adjacent pixel positions and applying the following set of rules:

a) if two black pixels are separated by no more than N−2 white pixels in the horizontal direction, convert signals representing the white pixels to black;

b) if two black pixels are separated by no more than M−2 white pixels in the vertical direction, convert signals representing the white pixels to black;

c) if two black pixels are separated by no more than M−2 white pixels in the first diagonal direction, convert signals representing the white pixels to black;

d) if two black pixels are separated by more than M−2 white pixels in the second diagonal direction convert signals representing the white pixels to black;

applying the above steps to all pixels in said image; outputting the modified image for optical character recognition.

5,182,779

DEVICE, SYSTEM AND PROCESS FOR DETECTING TENSILE LOADS ON A ROPE HAVING AN OPTICAL FIBER INCORPORATED THEREIN

William L. D'Agostino, Irving; Michael D. Barrick, and Glen R. Williams, both of Arlington, all of Tex., assignors to LTV Aerospace and Defense Company, Grand Prairie, Tex.

Filed Apr. 5, 1990, Ser. No. 506,034

Int. Cl.[5] G02B *6/44*

U.S. Cl. 385—13 **38 Claims**

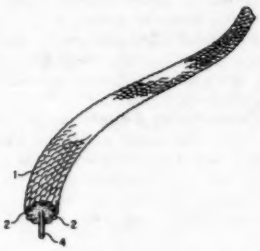
1. A system for detecting tensile loads on a rope comprising:

a plurality of elongated load-bearing members, said elongated load-bearing members being arranged into an elongated shape of a rope, said elongated shape having a long axis, said elongated shape being capable of a change in length along the long axis and structured for bearing tension loads along the long axis;

at least one fiber optical incorporated with the elongated load-bearing members along the length thereof;

an input signal transmitter, said input signal transmitter transmitting electromagnetic radiation into said fiber optic; and

a signal monitor, said signal monitor monitoring electromagnetic radiation exiting from said fiber optical and comparing an observed set of characteristics of the electromagnetic radiation exiting from said fiber optic to an expected set of characteristics of electromagnetic radiation exiting from said fiber optic.



5,182,780

OPTICAL BACKPLANE INTERCONNECTING CIRCUIT BOARDS

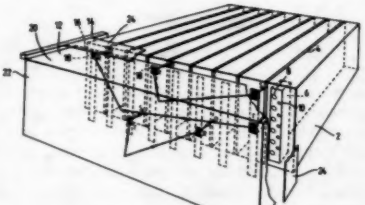
Stuart C. Robertson, North Watford, England, assignor to GPT Limited, England

Filed Nov. 13, 1991, Ser. No. 791,458

Claims priority, application United Kingdom, Nov. 14, 1990, 9024713

Int. Cl.[5] G02B *6/26*; G03H *1/02*; H01J *5/16*

U.S. Cl. 385—14 **13 Claims**



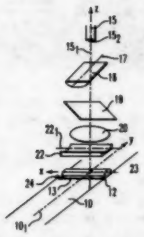
1. A system for interconnection of a stack of circuit boards, wherein each of at least a plurality of the circuit boards has an end region carrying one or more light transmitters or light receivers, an optical structure forming an interconnecting backplane for the circuit boards, the optical structure comprising a first surface carrying a multiplicity of non-reflecting hologram elements disposed to receive light beams from said light transmitters and to route said light beams to a second reflective surface where said light beams are reflected back to said hologram elements for routing to said light receivers.

5,182,781

OPTICAL DEVICE FOR THE OBSERVATION OF AN ELONGATED OBJECT

Jean-Claude Lehureau, Sainte Genevieve des Bois, and Sophie Neubert, Les Ulis, both of France, assignors to Thomson-CSF, Puteaux, France

Continuation of Ser. No. 448,509, Dec. 11, 1989, Pat. No. 5,125,052. This application Mar. 2, 1992, Ser. No. 844,759
Claims priority, application France, Dec. 9, 1988, 88 16218
Int. Cl.[5] G02B *6/32*
U.S. Cl. 385—33 18 Claims



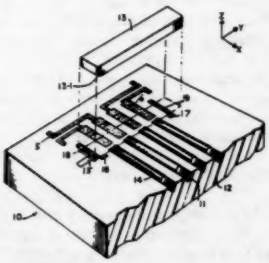
1. A device for observation, with an observation lens, of an elongated objected or an object elongated zone, said device comprising, in the vicinity of, or in contact with, the object or the zone: a first cylindrical lens including an axis extending along the largest dimension of said object or zone, wherein the focal distance of said first cylindrical lens is small relative to the focal distance of said observation lens and wherein said observation lens is constructed so as to allow the observation of the whole of said elongated object observable from said first cylindrical lens.

5,182,782

WAFERBOARD STRUCTURE AND METHOD OF FABRICATING

Marvin Tabasky, Peabody; Victor Cataldo, Wilmington; Thomas W. Fitzgerald, Framingham; Jagannath Chirravuri, Medfield; Craig A. Armiento, and Paul O. Haugsjaa, both of Acton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 551,219, Jul. 11, 1990, Pat. No. 5,077,878. This application Jan. 7, 1992, Ser. No. 817,570
Int. Cl.[5] G02B *6/42*
U.S. Cl. 385—89 7 Claims



1. A package, including a substrate, for aligning a plurality of optical receiving elements to a plurality of active elements integrated on a chip, comprising:

two front pedestal structures and one side pedestal structure at respective locations on a surface of said substrate;

two vertical pedestal structures at respective locations on the surface of said substrate;

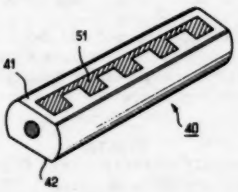
wherein said chip is mounted on said vertical structures in abutting contact with said front pedestal structures and with said side pedestal structure, such that said receiving elements are in optical communication with said active elements.

5,182,783

PROCESS FOR MANUFACTURING A MONOMODE OPTICAL WAVEGUIDE MADE OF A POLYMER AND ENDOWED WITH ELECTROOPTIC PROPERTIES, AND SUCH AN OPTICAL WAVEGUIDE

Dominique Bosc, Lannion; Martine Guilbert, Trebeurden, and Christian Toinen, Begard, all of France, assignors to France Telecom, Paris, France

Filed Aug. 22, 1991, Ser. No. 748,701
Claims priority, application France, Aug. 24, 1990, 90 10635
Int. Cl.[5] G02B *6/16*
U.S. Cl. 385—123 25 Claims



17. A monomide cylindrical optical waveguide made of a polymer, such a guide permitting a modulation, by electrooptic effect, of the light wave which it transmits, which comprises:

a core (11) formed by a mixture comprising especially a core polymer and an electrooptically active organic substance such that the core exhibits an optical activity under the action of an external electric field, the core diameter (d_c) having the required dimension in order for the optical waveguide to be monomode,

an optical cladding (40) made of a cladding polymer surrounding the core, said cladding polymer being obtained by polymerization of the polymerizable core mixture, copolymerized with a monomer possessing a very low refractive index,

electrodes (51, 52) for polarization and excitation of the optically active substance.

5,182,784

OPTICAL FIBER OR FILAMENT REINFORCEMENT COATING

Thomas P. Hager, Westerville, and Janet A. Hendry, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Filed Jul. 19, 1991, Ser. No. 732,526
Int. Cl.[5] G02B *6/02;* B05D *5/06;* D02G *3/00;* G03G *15/00*
U.S. Cl. 385—128 21 Claims

5. An optical fiber comprising a layer of reinforcing material substantially covering an optical fiber, the reinforcing material comprises continuous filaments coated with a residue produced by evaporating water from an aqueous coating composition of consisting essentially of, on a weight percent basis:

	Weight Percent
thermoplastic polyurethane latex	2–50
a first curable acrylic latex	3–55
a third ingredient wherein the third ingredient is a paraffin wax emulsion or a second curable acrylic latex the second acrylic latex being different from the first acrylic latex	0.5–10
water	balance

the aqueous composition having a final solids content ranging from 1 to 60 weight percent.

5,182,785

HIGH-FLEX OPTICAL FIBER COIL CABLE

Emile G. Savegh, Austin; John E. Martinez, Port Arthur, and Alfredo Cedrone, Austin, all of Tex., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Oct. 10, 1991, Ser. No. 774,409
Int. Cl.[5] G02B 6/26, 6/02
U.S. Cl. 385—128 9 Claims

1. A coiled flexible optical fiber cable comprising:
(a) a clad optical fiber coated with a protective polymer coating;
(b) wrapped around said coated clad fiber at least two layers of porous expanded polytetrafluoroethylene tape; and
(c) around said expanded polytetrafluoroethylene tape layers a heat-set high Durometer D hardness jacket.

5,182,786

ACTIVE ENERGY BEAM-CURABLE COMPOSITION CONTAINING PARTICLES AND COATED OPTICAL FIBER

Yoshimasa Kinaga; Masao Ogawa, both of Kanagawa, and Yoshihiro Kiyomura, Hiratsuka, all of Japan, assignors to Kansai Paint Co., Ltd., Amagasaki, Japan

Filed Dec. 13, 1989, Ser. No. 450,190
Claims priority, application Japan, Dec. 23, 1988, 63-325113
Int. Cl.[5] G02B 6/44; C08K 9/00; C08F 2/50; B32B 17/04
U.S. Cl. 385—128 7 Claims

1. A coated optical fiber prepared by the steps of:
applying a coating of an active energy beam-curable composition to the surface of an optical fiber, the composition comprising about 100 parts by weight of an active energy beam-curable substance selected from the group consisting of ethylenically unsaturated group-containing resins, ethylenically unsaturated monomers, and ethylenically unsaturated oligomers, and about 0.5 to about 100 parts by weight of a particulate substance having a means particle size of about 1 to about 50 μm and selected from the group consisting of particles of silica, calcium carbonate, talc, mica, clay, barium sulfate, ceramics, metallic oxides, polyamide, acrylic resin, polyethylene, polypropylene, polycarbonate, polyurethane, epoxy resin, polyethylene terephthalate, polyvinylidene fluoride, polytetrafluoroethylene and silicone resin; and
curing and coating to give a cured coating containing said particulate substance in the form of particles.

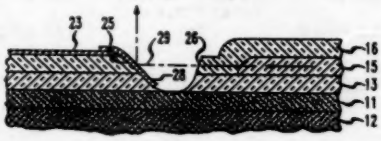
5,182,787

OPTICAL WAVEGUIDE STRUCTURE INCLUDING REFLECTIVE ASYMMETRIC CAVITY

Greg E. Blonder, Summit; Mark A. Cappuzzo, Linden; Harold R. Clark, Fanwood; Ronald E. Scotti, White House Station, and Yiu-Huen Wong, Summit, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 692,433, Apr. 29, 1991. This application Mar. 5, 1992, Ser. No. 846,094
Int. Cl.[5] G02B 6/10
U.S. Cl. 385—131 8 Claims

1. An optical waveguide structure comprising:
a first layer of relatively low refractive index glass;
a second layer of relatively high refractive index glass overlying the first layer;
the second layer being patterned to define optical waveguide portions for propagating light along optical paths;
a third layer of relatively high refractive index glass overlying the second layer;
the third layer overlying a first end of a first waveguide portion defined by part of the second layer;
and an asymmetric cavity extending through the third layer and at least part of the first layer which is adjacent the first end of the first optical waveguide portion and which



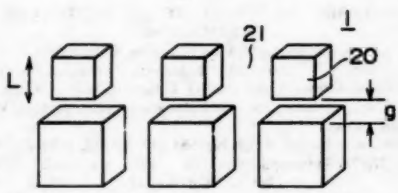
intersects the optical path defined by the first waveguide portion, said cavity having a steeper slope on a first side thereof which is closest to the waveguide portion than on a second side thereof which is most remote from the waveguide portion;
the second side of the asymmetrical cavity constituting a mirror surface which is capable of reflecting light to or from said first optical waveguide portion.

5,182,788

OPTICAL BANDPASS FILTER HAVING A VARIABLE PASSBAND WAVELENGTH

Kazuhiro Tanaka, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 19, 1992, Ser. No. 854,535
Claims priority, application Japan, Mar. 20, 1991, 3-57425
Int. Cl.[5] G02B 6/10; H01S 3/30; H01L 27/12
U.S. Cl. 385—131 9 Claims



1. An optical bandpass filter supplied with an incident optical beam including therein a plurality of optical components with respective wavelengths that differ from each other, for selectively passing a specified optical component having a specified wavelength, comprising:
a waveguide region having upper and lower major surfaces and extending from an input end to an output end for guiding the optical beam supplied to said input end, from said input end to said output end;
a clad structure provided above and below the waveguide region for confining the optical beam in said waveguide region;
a plurality of quantum well boxes formed in the waveguide region with respectively different quantum levels, said quantum well boxes comprising a material having a first band gap and defined by a boundary for all of the three-dimensional directions, said quantum well boxes having a variety of sizes in at least one of said three-dimensional directions, for selectively absorbing the optical components in the incident optical beam that causes a resonance with the quantum level of the quantum well box;
a barrier region provided in said waveguide region for surrounding each of the plurality of quantum well boxes with respect to all of three-dimensional directions, said barrier

region comprising a material having a second band gap that is substantially larger than said first band gap; and

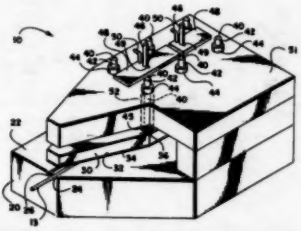
window means provided on the clad structure for directing a control optical beam such that the control optical beam irradiates the plurality of quantum well boxes.

5,182,789

OPTICAL FIBER HOLDER

Shelia K. Nash-Stevenson, Madison, and Dennis M. Stockbridge, Huntsville, both of Ala., assignors to Hughes Aircraft Company, Los Angles, Calif.

Filed Jun. 20, 1990, Ser. No. 541,105
Int. Cl.[5] G02B *7/00*
U.S. Cl. 385—137 **9 Claims**



1. An apparatus for securing optical fibers comprising:

a base having a top surface, said top surface defining at least one groove extending across said top surface, said at least one groove having a retaining section smaller than a cross-section of the optical fiber and defining an opening slightly larger than a diameter of the optical fiber;

a least one flat strand retaining plate spaced from the top surface of said base;

a support frame fixedly attached to said base, said support frame including a plurality of through openings;

at least one lifting member attached to said at least one strand retaining plate for removably placing said at least one strand retaining plate over said at least one groove;

a plurality of support members attached for joint movement with said at least one strand retaining plate and extending completely through said openings in said support frame for allowing said at least one strand retaining plate to be removably placed over said at least one groove and for maintaining alignment of said at least one flat strand retaining plate over said at least one groove;

bias means engaging said support frame and said retaining plate for urging said at least one strand retaining plate against said top surface of said base; and

means mounted on at least one support member for modulating said bias means, said means limiting movement of said support member and retaining plate relative to said frame, thereby controlling the force applied by said bias means against said retaining plate.

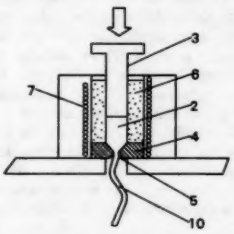
5,182,790

INFRARED OPTICAL FIBER AND A METHOD OF MANUFACTURING THE SAME

Kazuhiro Kayashima; Fumikazu Tateishi, both of Hirakata, and Kiyoko Ohshima, Shijonawate, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 3, 1991, Ser. No. 679,877
Claims priority, application Japan, Apr. 5, 1990, 2-91701
Int. Cl.[5] G02B *6/16*
U.S. Cl. 385—141 **6 Claims**

1. An infrared optical fiber comprising silver halide polycrystals which have a composition ratio of silver chloride and silver bromide in the range of 30 to 70 percent by weight of silver chloride, and have an average grain size of 5 μm or less, said infrared optical fiber having mechanical strength and bending characteristics sufficient to be bent approximately 100 times with a bending radius of 10 mm and approximately 2000 times with a bending radius of 20 mm, said infrared fiber having optical characteristics of high transmittance, low absorption loss, low scattering loss, and a small launching angle.

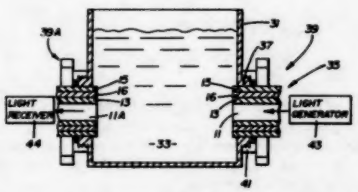


5,182,791

PROBE FOR TRANSMITTING LIGHT THROUGH A FLUID

Michael J. Pollack, 2089 N. Line St., Lansdale, Pa. 19446

Filed Aug. 1, 1991, Ser. No. 739,093
Int. Cl.[5] G02B *6/00*
U.S. Cl. 385—147 **8 Claims**



1. A probe for transmitting light through a fluid which is disposed in a carrier means, which carrier means has an aperture therein, comprising in combination:

voidless rod means, which is formed to pass light energy with relatively little distortion with respect to amplitude and frequency;

metal housing means, with an aperture therethrough and with said voidless rod disposed in said aperture;

fusing means, disposed between said voidless rod and said metal housing means, said fusing means being fired to fuse said fusing means, to both said metal housing means and said voidless rod, whereby said voidless rod is held firmly within said metal housing means; and

securing means, secured to said metal housing means and formed to be secured to said carrier means to dispose at least a part of said voidless rod through said aperture in said carrier means to come in contact with said fluid held by said carrier means.

5,182,792

PROCESS OF ELECTRIC PIPELINE HEATING UTILIZING HEATING ELEMENTS INSERTED IN PIPELINES

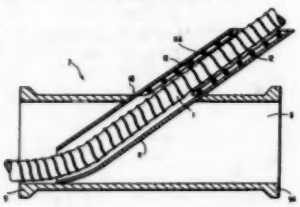
Carlos Alberto D. C. Goncalves, Rio de Janeiro, Brazil, assignor to Petroleo Brasileiro S.A. - Petrobras, Rio de Janeiro, Brazil

Filed Aug. 28, 1991, Ser. No. 750,995
Claims priority, application Brazil, Aug. 28, 1990, 9004240[U]
Int. Cl.[5] F24D *15/02*; E21B *7/15*
U.S. Cl. 392—468 **4 Claims**

1. Process of electric heating of pipelines carrying fluids viscous and/or rich in organic residues, comprising:

disconnecting, at pre-defined points, the fluid-carrying pipelines (15, A, B, . . . Z) which are obstructed, intercalating

in said points a pipeline coupling spool (7) provided with a lateral opening (10), introducing through said lateral opening (10) a heating element (1), causing said heating element (1) to penetrate into said fluid-carrying pipelines and to be displaced through the same, applying to said heating element (1), simultaneously with its introduction into said coupling spool (7), an electric current from a generating source located at the surface of the source such that the heat generated by said heating element (1) is transmitted to the viscous fluid inside said fluid-carrying pipeline and modifies the pipeline physical characteristics until at least the residual mass detaches from an internal surface of said fluid-carrying pipeline and re-establishes conditions for fluid flow, and wherein said coupling spool (7) includes a cylindrical body (8) with a diameter equal to



that of the pipeline carrying said fluids viscous and/or rich in organic residues, provided with adaptors (9, 9A) in its extremities for connection between pipelines and having said opening (10) in a lateral wall thereof, said coupling spool further comprising:

a guide-channel (11) which penetrates inside said cylindrical body (8) and attached to said lateral opening (10), fully sealing said lateral opening and extending partially outside said cylindrical body (8); and said method further comprises:

dynamically sealing a portion (11A) of the guide-channel (11) which extends outwards and orienting, centralizing and introducing said heating element (1) inside the fluid-carrying pipeline via bearings interposed between the guide channel (11) and said heating element (1).

5,182,793

COMPUTER-AIDED DECISION MAKING WITH A SYMBOLIC SPREADSHEET

Rhonda L. Alexander; Michael E. Irrgang; John A. Kirchner; Marsha H. Ellis; Charles Warren Young, all of Austin, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 821,234, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 373,420, Jun. 30, 1989, abandoned. This application Jun. 9, 1992, Ser. No. 896,731

Int. Cl.[5] G06F *15/18*

U.S. Cl. 395—13 **14 Claims**

1. In a computer system having a stored system of rules and a knowledge base of facts, events, and programming, an improved method for using said computer to display a problem scenario and modify the scenario according to a best choice among alternative choices in a particular solution domain, comprising the steps of:

representing a real world problem to be solved as at least one data object;

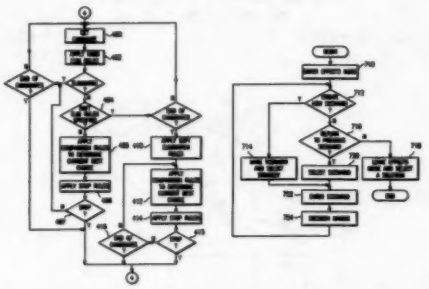
generating a problem scenario from a number of data objects, wherein said objects are arranged as a symbolic spreadsheet in which cells of said spreadsheet are frames representing said objects and their attributes and wherein said cells are linked by relationship attributes of said objects;

displaying said problem scenario to a user;

generating a pool of candidate solutions to said problem scenario;

determining a candidate selection strategy for evaluating said candidates, wherein said strategy defines a method for applying rules;

evaluating said candidates, using said candidate selection strategy to access and apply a combination of hard elimination rules, soft elimination rules, and comparison rules from a stored system of rules, to each of said candidate solutions until a best candidate is selected;



assigning a solution value representing said best candidate to variables of said problem scenario;

modifying said scenario to substitute said solution value, such that a new scenario reflecting the effects of said solution value is generated, wherein all objects having attributes affected by said solution value are modified; and

displaying said modified scenario to a user.

5,182,794

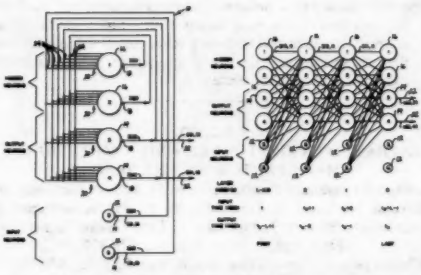
RECURRENT NEURAL NETWORKS TEACHING SYSTEM

Michael L. Gasperi, Caledonia, and Wesley Davis, Franklin, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Continuation of Ser. No. 551,983, Jul. 12, 1990, abandoned. This application Mar. 27, 1992, Ser. No. 860,225

Int. Cl.[5] G06F *15/18*

U.S. Cl. 395—23 **7 Claims**



1. A training apparatus for determining proper weights for recurrent output and recurrent hidden neurons in a recurrent neural network as derived from a teaching set of sequential teaching inputs and teaching outputs, the training apparatus comprising:

a predetermined number of layers including a first layer and a last layer,

each layer having layer inputs and layer outputs and layer error inputs and layer error outputs,

the layer outputs of a given layer connected to the layer inputs of any immediately succeeding layer,

the layer error outputs of any given layer connected to the layer error inputs of any immediately preceding layer,

each of the layers including:

a plurality of input neurons receiving teaching inputs and producing neuron outputs equal to those teaching inputs,

a number of output neurons and hidden neurons, equal in number to the number of recurrent output neurons and recurrent hidden neurons in the recurrent neural network and having neuron inputs and neuron outputs and neuron error inputs and neuron error outputs,

each output and hidden neuron having an associated set of weights independent of the other weights of that layer but identical to the weights of a corresponding neuron of the preceding and succeeding layer,

wherein the output and hidden neurons generate neuron outputs as a function of neuron inputs multiplied by the weights,

wherein the hidden neurons generate error outputs as a function of neuron error inputs multiplied by the weights and of the neuron output for that neuron,

wherein the neuron inputs of the hidden and output neurons are connected to the layer inputs and the neuron outputs of the hidden and input neurons are connected to the layer outputs,

wherein the neuron error inputs of the hidden neurons are connected to the layer error inputs and the neuron error outputs of the hidden and output neurons are connected to the layer error outputs;

a weight corrector means for receiving final neuron error outputs from the layer preceding the first layer and changing the weights of the hidden and output neurons to produce corrected weights; and

a communication means for transferring the corrected weights of the output and hidden neurons to corresponding recurrent output and recurrent hidden neurons in the recurrent neural network.

5,182,795

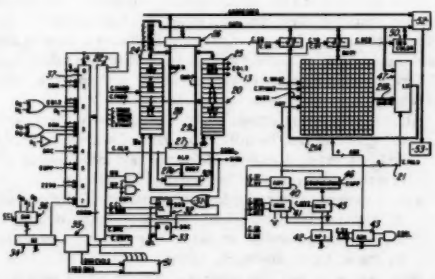
PROCESS AND DEVICE FOR GRAPHICALLY DRAWING POINT BY POINT A CLOSED CURVE OF THE SECOND ORDER

Frederic Boutaud, Roquefort-les-Pins, and Gerard Chauvel, Antibes, both of France, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 16, 1988, Ser. No. 168,711

Int. Cl.[5] G06F *15/20*

U.S. Cl. 395—142 **6 Claims**



1. A drawing device for carrying out a process for graphically drawing point by point at least one arc of a closed curve of the second order, wherein the plane intended to contain the curve to be drawn is divided into octants, said drawing device comprising:

screen memory means for storing data relating to the points on a display screen defining the plane on which the closed curve of the second order is to be drawn;

point processor means operably coupled to said screen memory means for modifying the data stored in said screen memory means at locations therein corresponding to the points of the curve to be drawn on the display screen;

address processor means operably coupled to said screen memory means and to said point processor means for controlling access to said screen memory means and processing point data in providing the calculations necessary to accomplish an iterative point by point drawing on the display screen, said address processor means controlling the operation of said point processor means and data transfer between said point processor means and said screen memory means in the modification of the data stored in said screen memory means as a function of the curve to be drawn; and

memory means operably coupled to said point processor means and to said address processor means for respectively controlling the operation thereof, said CROM memory means having instructions stored therein relating to successive changes of a reference of relative coordinates provided by director and secondary axes U,V upon successive changes in octants as the arc of the curve is drawn on the display screen and instructions relating to the iterative point by point drawing of the arc of the curve as contained in each successive octant covered by the arc of the curve to be drawn.

5,182,796

MULTI-SCREEN SETTING CONDITION DISPLAY SYSTEM

Yoshinaru Shibayama, and Takao Ohtake, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

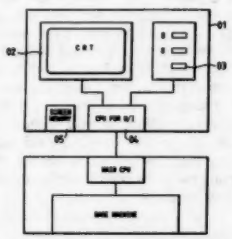
Continuation of Ser. No. 327,199, Mar. 22, 1989, abandoned.

This application Mar. 31, 1992, Ser. No. 875,192

Claims priority, application Japan, Mar. 23, 1988, 63-68380

Int. Cl.[5] G06F *15/62*

U.S. Cl. 395—156 **17 Claims**



1. A system for controlling a display unit displaying one of a plurality of screens, the display unit adapted for use as an operator interface in a recording apparatus, comprising:

means for selecting one of a plurality of function modes;

display control means for controlling the display unit to selectively display one of said plurality of screens, wherein said plurality of screens includes a selection-mode screen corresponding to each one of said plurality of function modes, each corresponding selection-mode screen including:

a set condition area, and

a selection area having a plurality of function settings, said plurality of function settings corresponding to a selected function mode and establishing operating conditions for the recording apparatus;

means proximate said display unit for defining a state for each one of said plurality of function settings; and

screen control means for controlling the display unit to display in said selection area the state of each one of said plurality of corresponding to said selected one of said plurality of function modes, and for controlling the display unit to display in said set condition area the state of function settings for at least another one of said plurality of function modes.

5,182,797

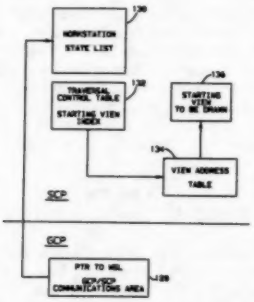
MULTI-PROCESSOR GRAPHICS DISPLAY SYSTEM FOR DISPLAYING HIERARCHICAL DATA STRUCTURES

Bob C.-C. Liang; Nina Y. Liang, both of West Hurley; Michael J. Phelps, Kingston, and David C. Tannenbaum, Kingston, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 425,891, Oct. 23, 1989, abandoned. This application May 27, 1992, Ser. No. 890,306

Int. Cl.[5] G06F *3/14*

U.S. Cl. 395—160 **9 Claims**



1. A multiprocessor system for displaying graphical data, comprising:

first processor means for generating a first data structure containing graphical data for display, said graphical data comprising a plurality of views, and a second data structure containing parameters for controlling the processing of the data contained in said first data structure, said second data structure including a control block indiating for each view whether said view requires traversal; and

second processor means for traversing the grpahical data contained in said first data structure ni accordance with the parameters contained in said second data structure to generate an image for display, said second processor means testing said control block before traversing a view and traversing the view only if said control block indicates that the view requires traversal.

5,182,798

MULTIPLE MATERIAL PROCESSING SYSTEM START-UP

Robert Francisco, New Fairfield, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 30, 1988, Ser. No. 292,059

Int. Cl.[5] G06F *13/00, 13/10, 4/00*

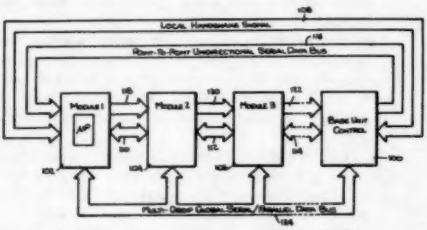
U.S. Cl. 395—200 **10 Claims**

1. A material processing system comprising a plurality of peripheral modules and a base module, said base module including a central processor, each of said peripheral modules including a peripheral processor,

a serial data link interconnecting each of said processors in a serial manner to form a communication loop,

said central processor including means for providing a system command signal along said serial link to the first of said peripheral module processors,

each said peripheral processor including means responsive to said system command signal for adding thereto a tag, said tag including data representative of the address and configuration of said processor, and for passing said system command signal along said serial data link to the next successive module processor, wherein the last of said



peripheral processors passes said system command signal and tags appended thereto to said base module central processor,

said base module central processor including storage means for storing the address and designation data of each said module.

5,182,799

RETRIEVING DATA USING HASH MEMORY ADDRESS GENERATED BY REVERSING /XOR BITS OF SELECTED BIT STRINGS OF AN INPUT PACKET ID

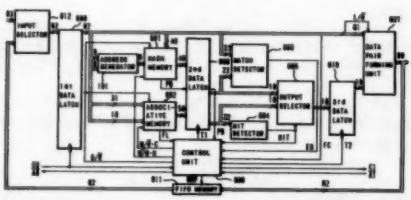
Toshiyuki Tamura; Masaki Fujita; Shinji Komori; Hisakazu Sato, and Hidehiro Takata, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1989, Ser. No. 416,887

Claims priority, application Japan, Apr. 21, 1989, 1-102712

Int. Cl.[5] G06F *12/02*

U.S. Cl. 395—400 **16 Claims**



13. A data retrieving apparatus which processes an input packet, included in a set of received input packets, each, of said received input packets having a plurality of identification data of an arbitrary bit length, with the identification data in each said input packet including at least two bit strings which have differing values in each of said received input packets, comprising:

address generating means for selecting partly the two bit strings from said identification data of said input packet, and generating a storing address of said input packet by a reversible operation of the selected bit strings;

a hash memory means for holding parts or all of a plurality of data packets, such hash memory means having addresses corresponding to the storing addresses generated by the address generating means;

first storing means for storing a part or all of said input packet in the hash memory at said storing address;

comparing means for comparing a part or all of the identification data of a stored packet previously stored at the

storing address with a part or all of the identification data of the input packet, and for determining the equivalence of said compared data, when a valid packet is already stored in said storing address reserved for the input packet;

second storing means for storing a part or all of said input packet regarding the identification data of the input packet as a retrieval data, when said comparing means judges said two identification data to be mismatched;

judging means for judging a match of the identification data of the input packet with the identification data of packets already stored in said second storing means, when a packet is input; and

selecting means for selecting an output from said first storing means or said second storing means in response to the result of the judgment of said judging means.

5,182,800

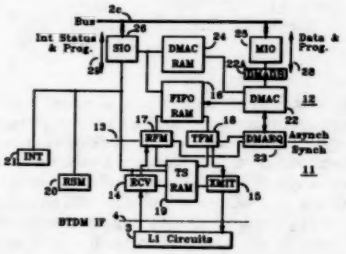
DIRECT MEMORY ACCESS CONTROLLER WITH ADAPTIVE PIPELINING AND BUS CONTROL FEATURES

Joseph K. Farrell, Boca Raton, Fla.; Jeffrey S. Gordon, Centreville, Va.; Daniel C. Kuhl, Delray Beach, and Timothy V. Lee, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 16, 1990, Ser. No. 614,524

Int. Cl.[5] G06F *13/14*

U.S. Cl. 395—425 **12 Claims**



1. A multi-channel DMA (Direct Memory Access) controller unit for controlling access to memory in a data processing system, via a system bus connectable to plural other device and controller units, said DMA controller unit and other units being required to arbitrate for access to said bus, said DMA controller unit containing plural internal channels for transferring data between said system memory and plural external devices having no direct connection to said bus and operating in asynchronous relation to said bus, said DMA controller unit comprising:

internal memory means, said internal memory means containing storage spaces assigned to said internal channels for storing data in transit through respective channels, and additional storage spaces assigned to said internal channels for storing control information defining operations to be conducted relative to respective channels and said system memory;

bus control means coupled to said system bus for arbitrating for and controlling said bus, and for operating through said bus to transfer data between said internal channels and said system memory;

DMA control (DMAC) means containing respective DMAC buffer registers for storing data and control information relative to any one of said internal channels; said DMAC means being coupled to said internal memory means for transferring data and control information between said DMAC buffer registers and said internal memory means relative to one said internal channel at a time; said DMAC means including means for performing logical operations relative to individual ones of said internal channels that are defined by control information held in said DMAC buffer registers, said logical operations including operations for preparing said bus control means for gaining control of said system bus and for transferring data through said bus between an internal channel and said system memory; and

DMA data buffer (DMADB) means containing respective DMADB buffer registers for holding data and control information associated with any one of said internal channels; said DMADB means interfacing between said bus control means and said DMAC means for transferring data and control information between its DMADB buffer registers and the DMAC buffer registers of the DMAC means, and for transferring data and control information between said DMADB buffer registers and said bus control means; said DMAC and DMADB means being capable of operating in a pipelined manner to sustain data transfer actions between said internal memory means and said bus control means relative to more than one internal channel at a time; said DMADB means and bus control means operating in tight coupled synchronism, and both operating in relative asynchronism to said DMAC means; so that while said DMAC means and said DMADB means are cooperating to prepare said DMADB means for a data transfer operation relative to one internal channels, said DMADB means and bus control means can be operating to conduct a data transfer operation between another internal channel and said system memory via said system bus.

5,182,801

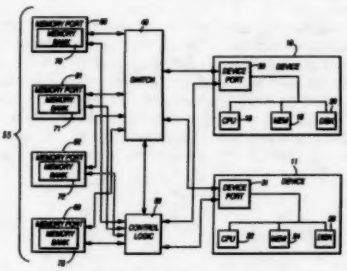
APPARATUS AND METHOD FOR PROVIDING FAST DATA TRANSFER BETWEEN MULTIPLE DEVICES THROUGH DYNAMIC RECONFIGURATION OF THE MEMORY SPACE OF THE DEVICES

Yousif R. Asfour, Boston, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 9, 1989, Ser. No. 363,672

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—425 **10 Claims**



1. A computer system, comprising:

a switch circuit;

a plurality of devices, each of said devices being independently coupled to said switch circuit, at least a first one of said devices having a memory space;

a plurality of memory banks, each of said memory banks being independently coupled to said switch circuit; and

control logic coupled to said switch circuit, said control logic controlling said switch circuit to provide changeable independent couplings between any of said memory banks and any of said devices, said control logic operating to dynamically reconfigure the memory space of said first device, said any of said memory banks being included in the memory space of said first device only when said any of said memory banks is coupled to said first device via said switch circuit.

5,182,802

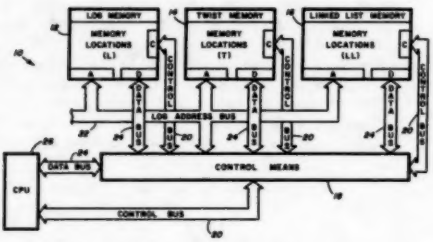
DATA ADDRESSABLE MEMORY ARCHITECTURE AND METHOD OF FORMING A DATA ADDRESSABLE MEMORY

Lawrence D. Dillard, P.O. Box 18238, Boulder, Colo. 80308

Filed Apr. 6, 1992, Ser. No. 864,463
Int. Cl.[5] G06F *13/00, 12/02*
U.S. Cl. 395—425 **20 Claims**

1. A data addressable memory architecture, comprising:

(a) a first memory defining a plurality of first memory locations capable of being sequentially identified by different address values and of storing data values at least some of which can be identical;



(b) a second memory defining a plurality of second memory locations capable of being sequentially identified by said data values and of storing said address values such that said second memory permits a subsequent one of said address values to over-write a previous one of said address values stored at the same one of said second memory locations identified by identical ones of said data values; and

(c) a third memory defining a plurality of third memory locations capable of being sequentially identified by said address values and of storing said over-written address values such that said address values over-written at said second memory locations of said second memory, which identify first memory locations of said first memory where identical ones of said data values are stored, are preserved at said third memory locations of said third memory.

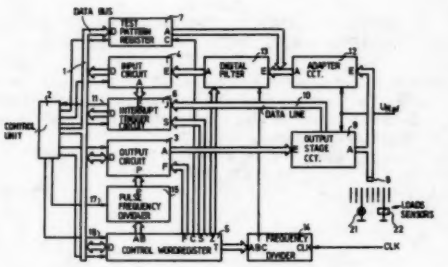
5,182,803

SYSTEM FOR INPUTTING AND/OR OUTPUTTING SIGNALS OF A DIGITAL CONTROL SYSTEM FOR A PRINTING MACHINE INCLUDING A DIGITAL FILTER

Anton Rodi, Leimen; Dieter Hauck, Eberbach; Karl-Heinz May, Viernheim, and Hans Müller, Sandhausen, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 132,560, Dec. 14, 1987, abandoned.
This application Mar. 14, 1991, Ser. No. 668,759
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3642500
Int. Cl.[5] G06F *15/46*
U.S. Cl. 395—575 **12 Claims**

1. The combination comprising a printing machine having a plurality of loads including relays for controlling elements of the printing machine, and indicators for indicating states of the printing machine, and a monitoring system for an electronic digital control system and said loads, the combination including an electronic digital control unit; a plurality of peripheral units; a bus system for interconnecting said monitoring system, said digital control unit and said peripheral units; the monitoring system including an output circuit having inputs connected to said control unit and output registers having register contents; an output stage circuit having inputs connected to said output circuit and to said loads, first outputs having output signals connected to said peripheral units for interrogating for fault conditions of said loads; an interrupt trigger circuit having outputs connected to said control unit, a data line connecting second outputs of said output stage circuit with inputs of said interrupt trigger circuit for triggering an interrupt of said control unit in response to a fault condition of at least one of said peripheral units, a digital filter connected between said monitoring system and said peripheral units for filtering out noise signals from said peripheral units, said combination further including means for interrogating said first outputs of said output stage circuit via addresses other than said address of the register which contains the output.



5,182,804

Patent Not Issued For This Number

5,182,805

METHOD AND SYSTEM FOR DETERMINING COPY-ON-WRITE CONDITION

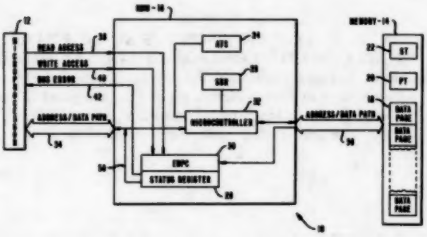
Mark D. Campbell, Lexington, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 14, 1989, Ser. No. 380,842
Int. Cl.[5] G06F *9/06*
U.S. Cl. 395—650 **8 Claims**

1. A method for determining a copy-on-write condition in a UNIX process comprising:

providing a page table with an entry identifying a memory

page location;
providing said entry with a copy-on-write bit;
transferring said bit to a circuit; and



generating a copy-on-write fault in said circuit if said memory page is to be written to and said copy-on-write bit is set to a predetermined value.

5,182,806

INCREMENTAL COMPILER FOR SOURCE-CODE DEVELOPMENT SYSTEM

William M. McKeeman, Hollis, and Shota Aki, Weare, both of N.H., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 30, 1989, Ser. No. 375,397
The portion of the term of this patent subsequent to Dec. 8, 2009, has been disclaimed.
Int. Cl.[5] G06F 9/45
U.S. Cl. 395—700 **22 Claims**

17. A method executing on a computer for incrementally recompiling a module of source text which has been previously compiled from a source-text buffer and linked to create a code

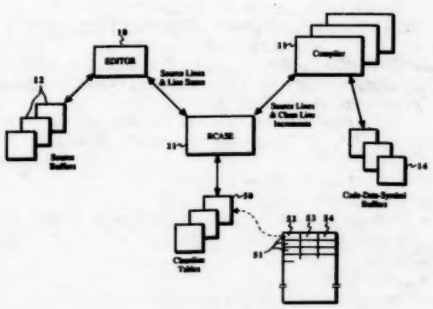


image of executable object code, said code image being executed to detect errors in said source text, said module containing a plurality of lines of source text, comprising the steps of:

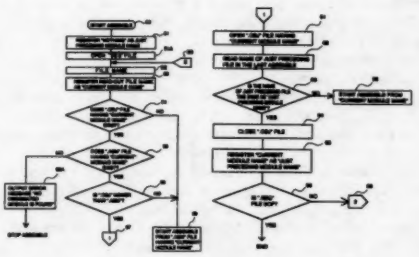
a) editing selected lines of said module of source text, said edited source text being stored in said source-text buffer as a plurality of lines;
b) incrementally recompiling each line of said source text which has been changed by said step of editing and each line of said source text which is dependent upon a line which has been changed to update said code image for changed lines in said source text and lines dependent upon changed lines, wherein lines of said source text not changed in said step of editing and not dependent upon changed lines are not recompiled and executable object code in said code image is reused for said lines not changed and not dependent upon changed lines.

5,182,807

ASSEMBLER SYSTEM FOR DETERMINING WHEN TO COMPILE SOURCE CODE MODULES

Harumi Mizuse, and Kazuhide Kawata, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 19, 1988, Ser. No. 286,118
Claims priority, application Japan, Dec. 18, 1987, 62-320504; Dec. 31, 1987, 62-334995
Int. Cl.[5] G06F 9/45
U.S. Cl. 395—700 **2 Claims**



1. An assembler system comprising:
first means for storing source code modules and object code modules assembled from said source code modules:
second means for storing an order of assemble of said source code modules;
third means for determining whether or not an object code module has been assembled from one of said source code modules;
fourth means for storing a prior assemble order of said source code modules;
fifth means for storing a source code module production time for each source code module with an object code module production time for said object code module assembled from said each source code module;
sixth means, coupled to said first, second, third, fourth, and fifth means, for evaluating each source code module in accordance with said assemble order stored in said second means to identify a first one of said source code modules for which
(1) an object module has not been assembled,
(2) said source code module production time for said each source code module is later than said object code module production time for said object code module assembled from said each source code module, or

(3) the position of said each source code module in said assemble order stored in said second means differs from the position of said each source code module in said prior assemble order stored in said fourth means; and

means for assembling said identified first source code module and each succeeding source code module, as ordered in said assemble order stored in said second store means, into object code modules.

5,182,808

MULTIPROCESSOR SYSTEMS HAVING DISTRIBUTED SHARED RESOURCES AND DEADLOCK PREVENTION

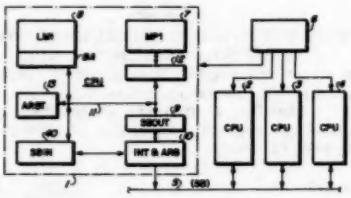
Carlo Bagnoli, Milan; Guido Perrella, Pescara, and Tommaso Majo, Paderno Dugnano, all of Italy, assignors to Honeywell Bull Italia S.p.A., Caluso, Italy

Filed Oct. 20, 1989, Ser. No. 424,378

Claims priority, application Italy, Nov. 18, 1988, 22651 A/88

Int. Cl.[5] G06F *13/14*

U.S. Cl. 395—725 **4 Claims**



1. A multiprocessor data processing system having distributed shared resources, where a plurality of processing units (CPU) communicate each to the other through a system bus, each CPU comprising:

a processor,

a local memory,

a system bus interface unit coupled to said system bus for arbitrating and obtaining access to said system bus,

a local bus for communication among said processor, said local memory and said interface unit,

an isolation block interposed between said processor and said local bus and coupled thereto for controlling access of said processor to said local bus,

an isolation and latching block interposed between said local bus and said interface unit and coupled thereto for controlling access of said interface unit to said local bus, said isolation and latching block receiving, from said processor and through said isolation block and said local bus, system bus access commands and posting said access commands to said interface unit,

an input block coupled to said local bus and, through a bypass means of said interface unit, to said system bus, said input block having means for latching a local memory access request received from said system bus until a local bus access grant signal responsive to said local memory access request has been received by said input block, whereby said local memory access request is transferred to said local bus under control of said input block independent of said isolation and latching block,

an arbitration unit coupled to said blocks through said local bus and receiving local bus access request signals from said isolation block, said isolation and latching block and said input block, for arbitrating and controlling local bus access of said blocks by means of local bus access grant signals,

said isolation and latching block comprising first circuit means for requesting access to said local bus on receipt of data from said system bus, through said interface unit, in response to a system bus access command posted to said interface unit, and

said isolation block comprising second circuit means responsive to a local bus access grant signal from said arbitration unit to said isolation and latching block for signalling to said processor that data received from said isolation and latching block are available on said local bus and ready for transfer from said isolation and latching block to said processor.

5,182,809

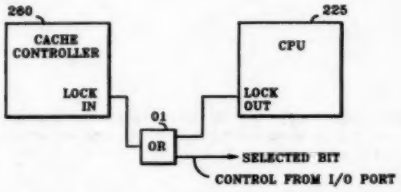
DUAL BUS MICROCOMPUTER SYSTEM WITH PROGRAMMABLE CONTROL OF LOCK FUNCTION

Ralph M. Begun, Boca Raton; Patrick M. Bland, and Philip E. Milling, both of Delray Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1989, Ser. No. 358,810

Int. Cl.[5] G06F *9/00*

U.S. Cl. 395—725 **4 Claims**



1. A multi-bus microcomputer system comprising:

a CPU and a cache subsystem connected together by a CPU local bus, said cache subsystem comprising an 82385 cache controller and a cache memory, system bus means connecting said 82385 cache controller to a random access memory and a plurality of addressable functional units, said CPU having a LOCK output and said 82385 cache controller having a LOCK input, and

logic means with a control input, said logic means coupled between said LOCK output of said CPU and said LOCK input of said 82385 cache controller, said logic means producing, in response to a predetermined signal on said control input, an inactive signal to said LOCK input of said 82385 cache controller to disable said LOCK input of said 82385 cache controller and, in absence of said predetermined signal, allowing said LOCK inputs of said 82385 cache controller to follow said LOCK output of said CPU.

5,182,810

ISOLATION GATES TO PERMIT SELECTIVE POWER-DOWNS WITHIN A CLOSELY-COUPLED MULTI-CHIP SYSTEM

James E. Bartling, Dallas; Wendell L. Little, Denton, and Kevin E. Deierling, Dallas, all of Tex., assignors to Dallas Semiconductor Corp., Dallas, Tex.

Filed May 31, 1989, Ser. No. 359,246

Int. Cl.[5] H02J *1/00, 3/14*; G01R *19/00*

U.S. Cl. 395—750 **35 Claims**

1. A system, comprising:

a microprocessor;

communication lines coupling said microprocessor to a communication channel interface;

a battery;

a timer circuit;

at least one additional electronic component;

an ancillary integrated circuit, connected

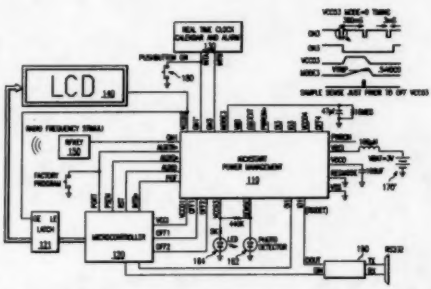
to receive power from said battery, and

to selectably provide power to said microprocessor, and

to selectably provide power to said additional component, and

to receive interrupts from said timer circuit;

wherein at least one of said communications lines is routed through said ancillary integrated circuit, and said ancillary



integrated circuit contains a switch to connect/disconnect said at least one of said communications lines.

5,182,811

EXCEPTION, INTERRUPT, AND TRAP HANDLING APPARATUS WHICH FETCHES ADDRESSING AND CONTEXT DATA USING A SINGLE INSTRUCTION FOLLOWING AN INTERRUPT

Ken Sakamura, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 172,035, Mar. 23, 1988, abandoned. This application Jul. 10, 1990, Ser. No. 554,945
Claims priority, application Japan, Oct. 2, 1987, 62-250216
Int. Cl.[5] G06F *13/24*
U.S. Cl. 395—800 **20 Claims**

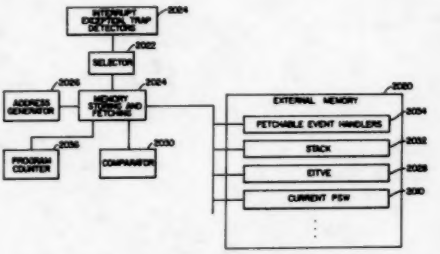
1. In a data processor which can execute a plurality of instructions which contains at least one control register for storing information which indicates the internal state of the data processor, and which has a capability for detecting exception, interrupt, and trap events, including instruction exceptions, interrupt request signals, and execution traps of an internal interrupt instruction, said events having predefined priority levels, apparatus for handling said events comprising:

a read-write memory which receives address signals and control signals from said data processor for storing data and instructions of said data processor, said read-write memory storing a plurality of fetchable executable event handlers, each event handler being a sequence of instructions stored at memory locations starting at an entry address;

means, coupled to said memory, for storing, in said read-write memory, a first information group that includes information indicative of the data processor internal state, said first information group including at least a part of the information stored in said at least one control register;

means, coupled to said read-write memory, for holding an entry address of an executable event handler;

means, coupled to said read-write memory, for storing in said read-write memory, under program control, a second information group, different from said first information



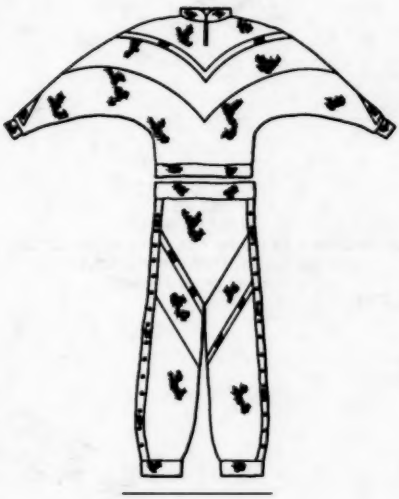
group, that includes information indicative of a data processor internal state to permit setting an internal state for each event handler under program control, said second information group stored in said read-write memory at a location obtainable when one of said fetchable event handlers is fetched; and

means, coupled to said read-write memory, being the same read-write memory in which said first information group is stored, for fetching from said read-write memory said second information group and for providing at least a part of said second information group to at least a part of said at least one control register in response to the fetching of an event handler and in the absence of a separate instruction for fetching said second information group.

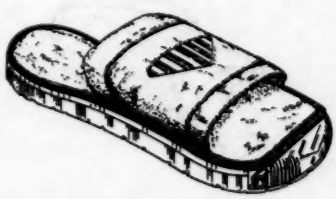
DESIGNS

JANUARY 26, 1993

332,686
WARM-UP SUIT
David B. Aubuchon, Festus; Karen J. Riebel, St. Louis, and William L. Schaefer, Arnold, all of Mo., assignors to Figgie International Inc., Willoughby, Ohio
Filed Sep. 10, 1990, Ser. No. 580,006
Term of patent 14 years
U.S. Cl. D2—29

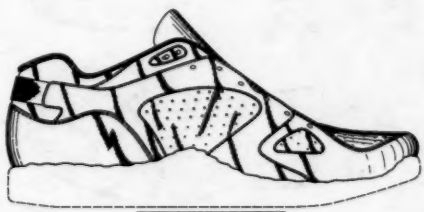


332,687
ILLUMINATED SLIPPER
Peter R. Altman, 13538 Maryearl La., Poway, Calif. 92064, and Yuval Shenkal, San Diego, Calif., assignors to Peter R. Altman, Poway, Calif.
Filed Oct. 28, 1991, Ser. No. 784,041
Term of patent 14 years
U.S. Cl. D2—265

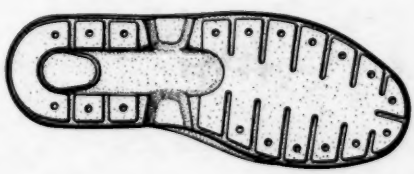


332,688
ATHLETIC SHOE UPPER AND SOLE PERIPHERY
James C. Autry, Dallas, Tex., assignor to Autry Industries, Inc., Dallas, Tex.
Filed Aug. 23, 1990, Ser. No. 572,099
Term of patent 14 years
U.S. Cl. D2—314

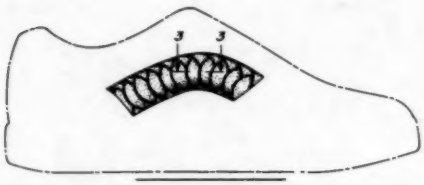
332,689
SHOE UPPER
Worthington, William J., Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 1, 1992, Ser. No. 877,223
Term of patent 14 years
U.S. Cl. D2—314



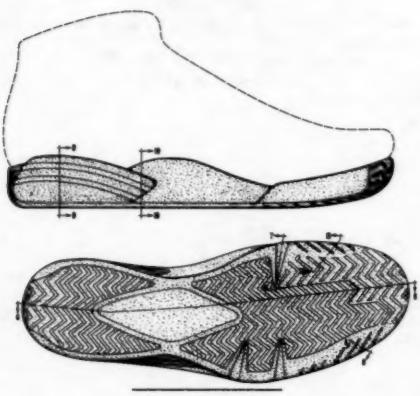
332,690
SHOE SOLE
Ejnar Truelsen, Tonder, Denmark, assignor to A/S Eccolet Sko, Bredebro, Denmark
Filed Jan. 8, 1990, Ser. No. 463,621
Claims priority, application Denmark, Jul. 6, 1989, 822/1989
Term of patent 14 years
U.S. Cl. D2—320



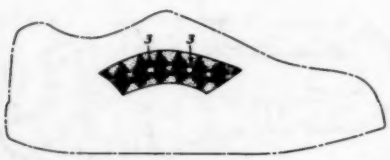
332,691
ORNAMENT FOR FOOTWEAR
Y. K. Shin, Pusan, Rep. of Korea, assignor to Mercury International Trading Corporation, North Attleboro, Mass.
Filed Aug. 22, 1990, Ser. No. 571,419
Term of patent 14 years
U.S. Cl. D2—326



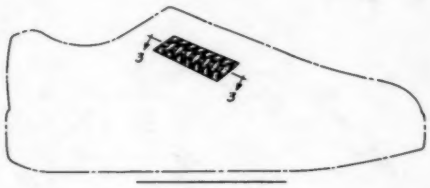
332,692
SHOE SOLE BOTTOM AND SIDE
Tinker L. Hatfield, Portland, and Wilson W. Smith, Beaverton, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed May 8, 1992, Ser. No. 880,011
Term of patent 14 years
U.S. Cl. D2—320



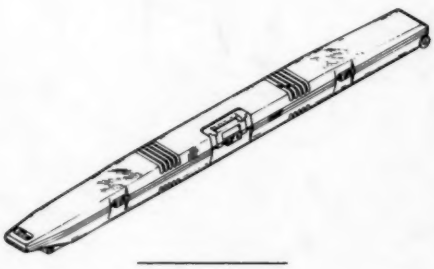
332,693
ORNAMENT FOR FOOTWEAR
Daniel Chen, Providence, R.I., assignor to Mercury International Trading Corporation, North Attleboro, Mass.
Filed Aug. 22, 1990, Ser. No. 571,420
Term of patent 14 years
U.S. Cl. D2—326



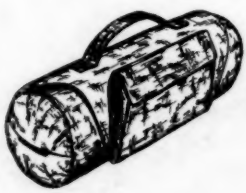
332,694
ORNAMENT FOR FOOTWEAR
Eliseo Marziali, Civitanova Marche, Italy, and Y. K. Shin, Pusan, Rep. of Korea, assignors to Mercury International Trading Corporation, North Attleboro, Mass.
Filed Aug. 31, 1990, Ser. No. 576,004
Term of patent 14 years
U.S. Cl. D2—326



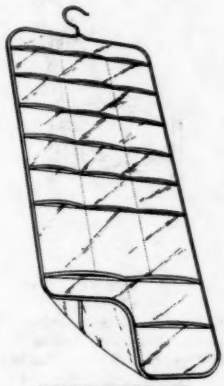
332,695
SKI CASE
Jerry Moscovitch, 59 Cowan Ave., Toronto, Canada M6K 2N1
Filed Sep. 28, 1990, Ser. No. 589,890
Term of patent 14 years
U.S. Cl. D3—36



332,696
COMBINED SHOPPING BAG AND COUPON STORAGE ORGANIZER
John Kendrick, Trabuco Canyon, Calif., assignor to GSA, Inc., Laguna Hills, Calif.
Filed Oct. 2, 1990, Ser. No. 594,870
Term of patent 14 years
U.S. Cl. D3—48

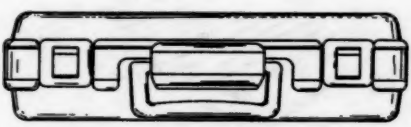


332,697
JEWELRY ORGANIZER
Micki Schildkraut, Kings Point, N.Y., assignor to E&B Giftware, Inc., Mount Vernon, N.Y.
Filed Apr. 25, 1990, Ser. No. 514,352
Term of patent 14 years
U.S. Cl. D3—75



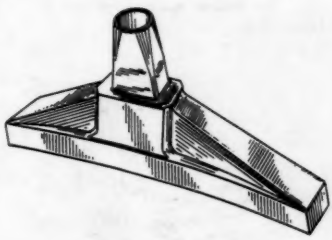
332,698
ATTACHÉ CASE
Francois Chauvin, Saone, France, assignor to Superior SA, Besancon, France
Filed Dec. 6, 1990, Ser. No. 623,052
Claims priority, application France, Sep. 24, 1990, 905927
Term of patent 14 years
U.S. Cl. D3—76

332,699
CARRYING CASE
Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.
Filed Mar. 1, 1991, Ser. No. 662,813
Term of patent 14 years
U.S. Cl. D3—76

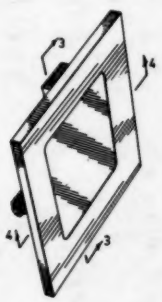


332,700
COMBINED COMB AND APPLICATOR FOR HAIR DYE
Tracy Hill, 1229½ Smithwood Dr., Los Angeles, Calif. 90035
Filed Sep. 4, 1990, Ser. No. 576,926
Term of patent 14 years
U.S. Cl. D4—117

332,701
BROOM CAP
Enzo Berti, Dolo, Italy, assignor to The Libman Company, Arcola, Ill.
Filed Sep. 14, 1990, Ser. No. 583,349
Term of patent 14 years
U.S. Cl. D4—199



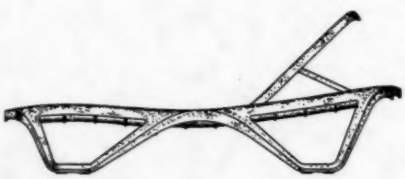
332,702
PICTURE FRAME
Gary Kaga, and John Arnott, both of Ontario, Canada, assignors to Invicta Products Incorporated, Toronto, Canada
Filed Mar. 22, 1990, Ser. No. 499,822
Term of patent 14 years
U.S. Cl. D6—310



332,703
COMBINED CHAIR AND TRAY
Barron J. Gulliver, Sturgis, Mich., assignor to Chrysalis, Inc., Bristol, Ind.
Filed Apr. 6, 1990, Ser. No. 505,550
Term of patent 14 years
U.S. Cl. D6—338

332,704
ROCKING CHAIR
Charles Desnoyers, St-Pie, Canada, assignor to Dutailier Inc., St-Pie, Canada
Filed Apr. 11, 1990, Ser. No. 507,589
Term of patent 14 years
U.S. Cl. D6—347

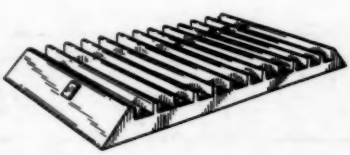
332,705
CHAISE LOUNGE
Georges Rougerie, Brion, France, assignor to Societe Pour La Transformation Des Matieres Plastiques Stamp, Nurieux, France
Filed Jan. 2, 1990, Ser. No. 459,586
Claims priority, application France, Jul. 3, 1989, 89 4335
Term of patent 14 years
U.S. Cl. D6—361



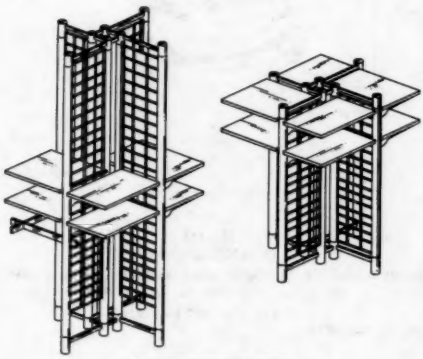
332,706
COLLAPSIBLE LOUNGE CHAIR
William G. Douglas, 1072 C North Dr., Delray Beach, Fla. 33445
Filed Nov. 7, 1989, Ser. No. 432,966
Term of patent 14 years
U.S. Cl. D6—368

332,707
CHAIR
Vladimir Müller, Toronto, Canada, assignor to Global Upholstery Co., Limited, Downsview, Canada
Filed Nov. 29, 1989, Ser. No. 443,647
Term of patent 14 years
U.S. Cl. D6—373

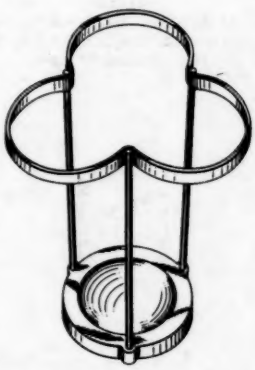
332,708
CASSETTE HOLDER
Roland Schmidt, and Klaus Lackner, both of Heidelberg, Fed. Rep. of Germany, assignors to Reinsenthel "programm", Puchheim, Fed. Rep. of Germany
Filed Aug. 17, 1990, Ser. No. 569,172
Claims priority, application PCT Int'l Appl., Aug. 13, 1990, 0011307
Term of patent 14 years
U.S. Cl. D6—407



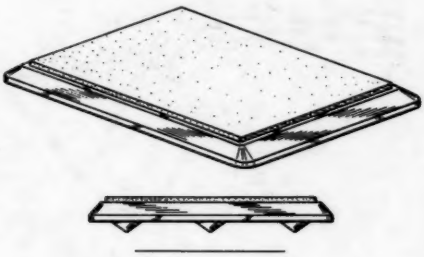
332,709
DISPLAY RACK
Charles Dayan, 1411 Broadway, New York, N.Y. 10018
Filed Apr. 23, 1990, Ser. No. 513,194
Term of patent 14 years
U.S. Cl. D6—415



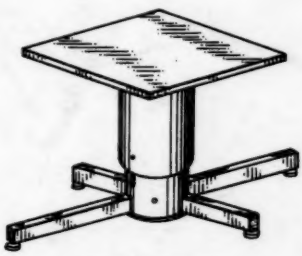
332,710
UMBRELLA STAND
Carl G. Magnusson, and Emanuela F. Magnusson, both of 350 E. 57th St., New York, N.Y. 10022
Filed Aug. 29, 1991, Ser. No. 751,698
Term of patent 14 years
U.S. Cl. D6—416



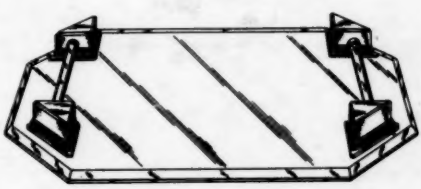
332,711
SUPPORT PLATFORM FOR COMPACT DISC AND TAPE PLAYERS
Norman J. Olson, 934 Baileyana Rd., Hillsborough, Calif. 94010
Filed Sep. 4, 1990, Ser. No. 577,596
Term of patent 14 years
U.S. Cl. D6—449



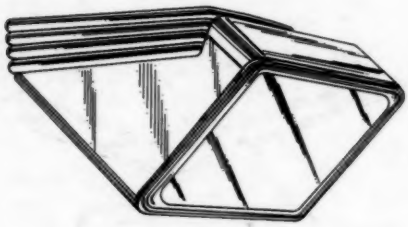
332,712
ADJUSTABLE TABLE BASE
Jan H. Schaen, 18154 Sweet Elm Dr., Lake Encino, Calif. 91316, assignor to Jan H. Schaen, Encino, Calif.
Filed Jan. 30, 1990, Ser. No. 472,481
Term of patent 14 years
U.S. Cl. D6—496



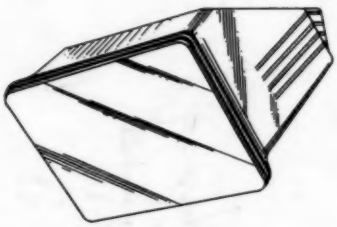
332,713
MIRRORED VANITY TRAY
Judith Kruger, Highland Park, Ill., assignor to Paris Presents Incorporated, Gurnee, Ill.
Filed Aug. 3, 1990, Ser. No. 562,650
Term of patent 14 years
U.S. Cl. D6—511



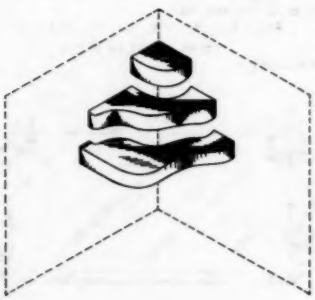
332,714
CEILING OR WALL-MOUNTED TV MONITOR SUPPORT
Marty Sedighzadeh, 11504 W. Berry Pl., Littleton, Colo. 80127, and Robert Bromley, Boulder, Colo., assignors to Marty Sedighzadeh, Littleton, Colo.
Filed Sep. 19, 1991, Ser. No. 762,952
Term of patent 14 years
U.S. Cl. D6—513



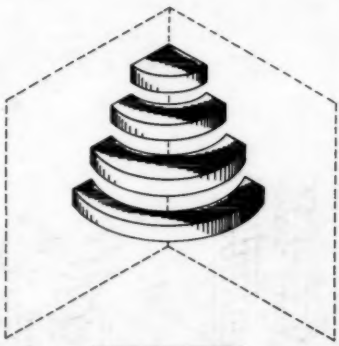
332,715
CEILING OR WALL MOUNTED TV MONITOR SUPPORT
Marty Sedighzadeh, 11504 W. Berry Pl., Littleton, Colo. 80127, and Robert Bromley, Boulder, Colo., assignors to Marty Sedighzadeh, Littleton, Colo.
Filed Sep. 19, 1991, Ser. No. 762,954
Term of patent 14 years
U.S. Cl. D6—513



332,716
FREE FORM SHELF COMBINATION
Russell Wolfe, III, 32 Moore Ave., Nashville, Tenn. 37210
Filed Sep. 28, 1990, Ser. No. 589,900
Term of patent 14 years
U.S. Cl. D6—570



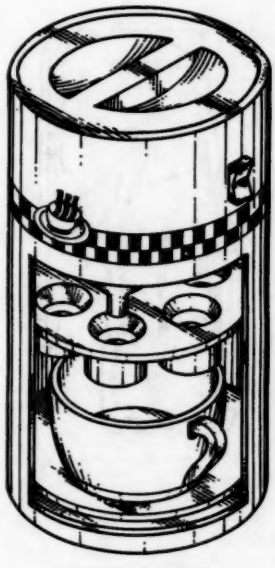
332,717
SHELVING ASSEMBLY
Russell Wolfe, III, 32 Moore Ave., Nashville, Tenn. 37210
Filed Sep. 28, 1990, Ser. No. 589,903
Term of patent 14 years
U.S. Cl. D6—570



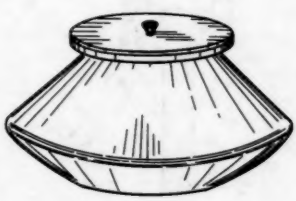
332,718
SHELVING ASSEMBLY
Russell Wolfe, III, 32 Moore Ave., Nashville, Tenn. 37210
Filed Sep. 28, 1990, Ser. No. 589,901
Term of patent 14 years
U.S. Cl. D6—574

332,719
SHELF
Russell Wolfe, III, 32 Moore Ave., Nashville, Tenn. 37210
Filed Sep. 28, 1990, Ser. No. 589,904
Term of patent 14 years
U.S. Cl. D6—574

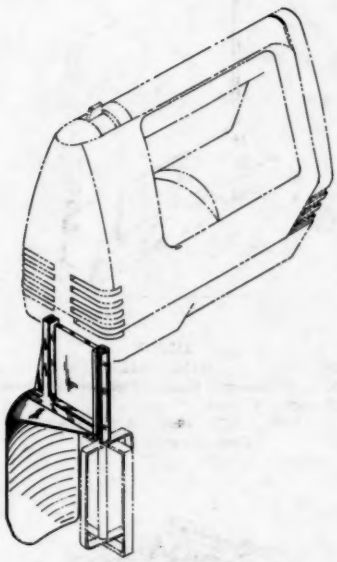
332,720
COMBINED COFFEE MAKER AND CUP
Gerald Shields, 8737 Orchard Ave., Omaha, Nebr. 68127
Filed Nov. 13, 1989, Ser. No. 434,171
Term of patent 14 years
U.S. Cl. D7—305



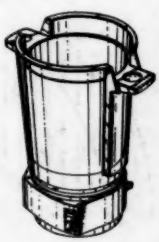
332,721
COOKING VESSEL
Kuldip S. Jauhal, and Meena K. Jauhal, both of 16290 Jackson Oaks Dr., Morgan Hill, Calif. 95037
Filed Dec. 3, 1990, Ser. No. 620,918
Term of patent 14 years
U.S. Cl. D7—354



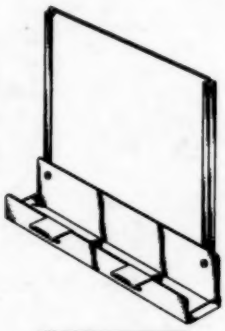
332,722
ATTACHMENT FOR A HAND MIXER
Philip A. Torbet, Tiburon, Calif.; Gary Van Deursen, Upper Saddle River, N.J., and Don R. McCloskey, Stratford, Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Dec. 11, 1990, Ser. No. 625,617
Term of patent 14 years
U.S. Cl. D7—412



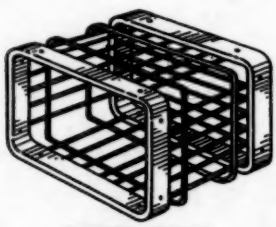
332,723
APPLIANCE FOR SLICING FRUITS AND VEGETABLES
Richard L. Geisaler, Chippewa Falls, and Roger L. Kelly, Eau Claire, both of Wis., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Jul. 18, 1990, Ser. No. 554,587
Term of patent 14 years
U.S. Cl. D7—381



332,724
SPICE RACK
Marvin M. Porter, San Antonio, Tex., assignor to Texas Trunk Company, Inc., San Antonio, Tex.
Filed Feb. 20, 1991, Ser. No. 658,356
Term of patent 14 years
U.S. Cl. D7—616

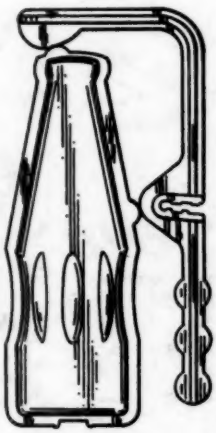


332,725
WINE CELL
Darrel May, Mississauga, Canada, assignor to Wiresmith Limited, Brampton, Canada
Filed Aug. 29, 1990, Ser. No. 574,255
Term of patent 14 years
U.S. Cl. D7—618

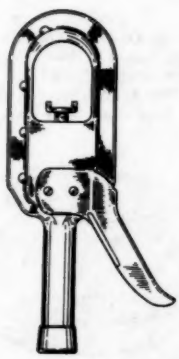


332,726
PAPER/NAPKIN HOLDER
Sheldon H. Goodman, 30905 Stratford, Solon, Ohio 44139, and Steven E. Greenhut, 6368 NW. 23rd Way, Boca Raton, Fla. 33496
Filed Jun. 5, 1991, Ser. No. 710,915
Term of patent 14 years
U.S. Cl. D7—631

332,727
FROZEN POP CONFECTION MAKER
Dennis Kupperman, Glenview, Ill., assignor to RB Toy Development Co., Skokie, Ill.
Filed Jan. 14, 1991, Ser. No. 641,071
Term of patent 14 years
U.S. Cl. D7—672

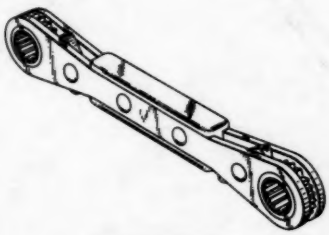


332,728
CRUSHING TOOL
Robert Dols, Mentone, Australia, assignor to Escam Pty. Ltd., Australia
Filed Nov. 29, 1990, Ser. No. 619,698
Claims priority, application Japan, Jul. 1, 1990, 2-1722
Term of patent 14 years
U.S. Cl. D7—680

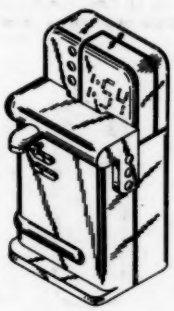


332,729
TREE STAKE SUPPORT
James R. Sessions, 147 Thayer Way, Vallejo, Calif. 94589
Filed Apr. 1, 1991, Ser. No. 677,968
Term of patent 14 years
U.S. Cl. D8—1

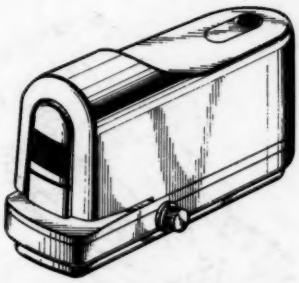
332,730
RATCHET WRENCH
Genji Usuda, Hachiohji, Japan, assignor to Top Kogyo Co., Ltd., Sanjo, Japan
Filed Sep. 26, 1990, Ser. No. 588,573
Claims priority, application Japan, Mar. 27, 1990, 2-10520
Term of patent 14 years
U.S. Cl. D8—25



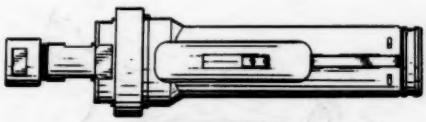
332,731
COMBINATION ELECTRIC CAN OPENER, CLOCK/TIMER, AND KNIFE SHARPENER
John J. Raab, Brielle, N.J., assignor to Robeson Industries Corp., South Plainfield, N.J.
Filed Feb. 1, 1991, Ser. No. 649,825
Term of patent 14 years
U.S. Cl. D8—34



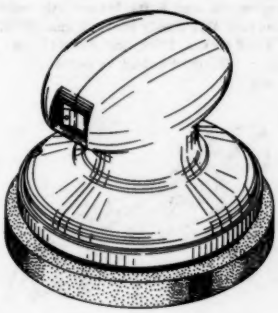
332,732
ELECTRIC STAPLER
Moritoshi Matsuno, Narashino, Japan, assignor to Marvzen Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 27, 1990, Ser. No. 486,279
Claims priority, application Japan, Oct. 4, 1989, 1-36272
Term of patent 14 years
U.S. Cl. D8—50



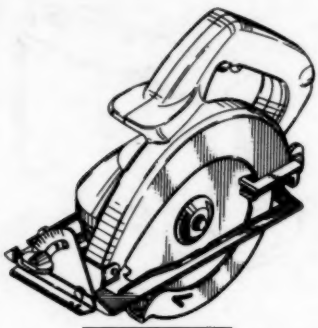
332,733
PNEUMATIC TOOL
Robert B. Staubitz, Collinsville, Conn.; Gregory P. Albert, Waverly, N.Y.; Kenneth J. Dubuque, Sheshequinn, and Kenneth D. Vanhorn, Sayre, both of Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Oct. 19, 1990, Ser. No. 604,435
Term of patent 14 years
U.S. Cl. D8—61



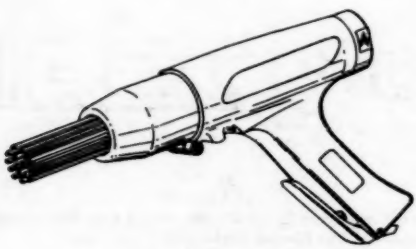
332,734
POLISHER
Fusao Fushiya, and Hideki Ohkubo, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Apr. 10, 1990, Ser. No. 507,178
Claims priority, application Japan, Oct. 24, 1989, 1-38824
Term of patent 14 years
U.S. Cl. D8—62



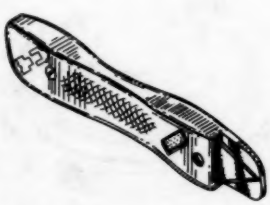
332,735
PORTABLE ELECTRIC CIRCULAR SAW
Fusao Fushiya, and Kiyotaka Ichikawa, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Anjo, Japan
Filed Nov. 13, 1990, Ser. No. 611,867
Claims priority, application Japan, May 31, 1990, 2-18454
Term of patent 14 years
U.S. Cl. D8—66



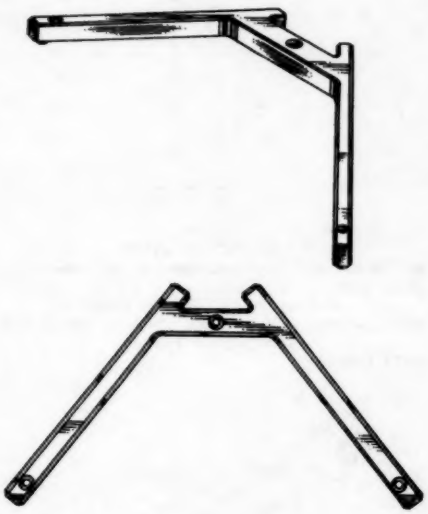
332,736
PORTABLE VIBRATING CHISEL
Toshio Mikiya, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan
Filed Dec. 26, 1990, Ser. No. 632,733
Term of patent 14 years
U.S. Cl. D8—68



332,737
CEILING TILE KNIFE
Wayne E. Wentworth, and Betty Wentworth, both of RR #4, C-544, Waterview Dr., Sandy Hook, Conn. 06482
Filed Oct. 5, 1989, Ser. No. 417,816
Term of patent 14 years
U.S. Cl. D8—98



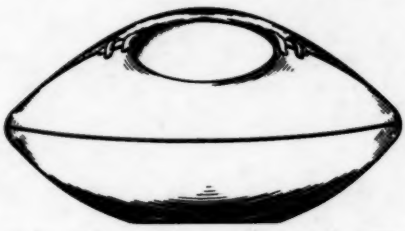
332,738
SUPPORT STAND
David H. Bloom, Vernon Hills, Ill., assignor to Cole-Parmer Instrument Company, Chicago, Ill.
Filed Sep. 5, 1990, Ser. No. 577,912
Term of patent 14 years
U.S. Cl. 78—380



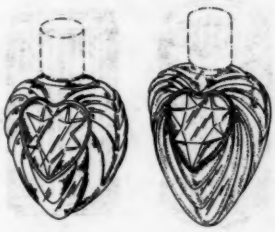
332,739
DISPENSING CONTAINER
Nick Petschek, New York, N.Y., assignor to ReSeal International Limited Partnership, New York, N.Y.
Filed Oct. 11, 1990, Ser. No. 596,341
Term of patent 14 years
U.S. Cl. D9—300

332,740
SHOPPING BAG
Gerald D. Robbins, 300 - B W. 28th St., National City, Calif. 91950
Filed Jul. 22, 1991, Ser. No. 733,248
Term of patent 14 years
U.S. Cl. D9—305

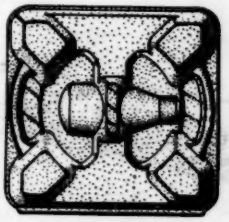
332,741
CONTAINER
Lawrence H. Turner, 3335 Oak Creek Dr. East, Colorado Springs, Colo. 80906
Filed Nov. 25, 1991, Ser. No. 797,795
Term of patent 14 years
U.S. Cl. D9—307



332,742
BOTTLE
Marc Gobe, New York, N.Y., assignor to Victoria's Secret Stores, Inc., Reynoldsburg, Ohio
Filed Aug. 3, 1992, Ser. No. 925,431
Term of patent 14 years
U.S. Cl. D9—315

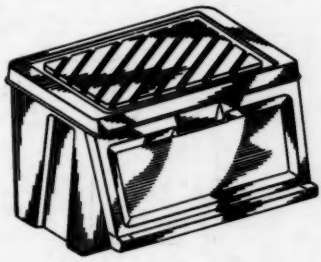


332,743
PACKAGE FOR FRAGILE TUBES
Henry R. Vigue, Waterville, Me., assignor to Keyes Fibre Company, Waterville, Me.
Filed Jun. 24, 1991, Ser. No. 721,201
Term of patent 14 years
U.S. Cl. D9—341

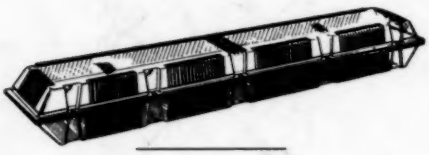


332,744
PACKAGE FOR WALLPAPER
Michael J. McCooey, Hudson, Ohio, assignor to Imperial Wall Coverings, Inc., Cleveland, Ohio
Filed Nov. 20, 1990, Ser. No. 617,054
Term of patent 14 years
U.S. Cl. D9—415

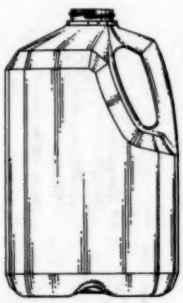
332,745
FRONT ACCESS STACKING BIN
Peter A. Koloski, Columbus, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 4, 1991, Ser. No. 637,886
Term of patent 14 years
U.S. Cl. D9—424



332,746
BOX FOR CUT FLOWERS
Pedro F. Garcia, Atlanta, Ga., assignor to Garcia Group, Inc., Atlanta, Ga.
Filed Jun. 26, 1991, Ser. No. 721,666
Term of patent 14 years
U.S. Cl. D9—426

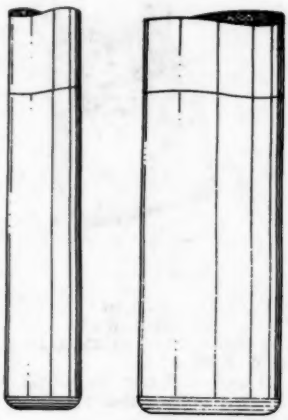


332,747
BOTTLE WITH HANDLE
Richard C. Darr, Seville, and Ralph D. Satterfield, Ashland, both of Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.
Filed Sep. 11, 1991, Ser. No. 757,495
Term of patent 14 years
U.S. Cl. D9—520

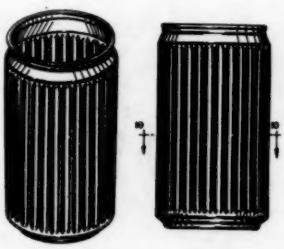


332,748
BOTTLE
John S. Reece, Cincinnati, Ohio; John Pardo, Yonkers, N.Y., and Timothy J. Beechuk, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jul. 23, 1991, Ser. No. 732,331
Term of patent 14 years
U.S. Cl. D9—528

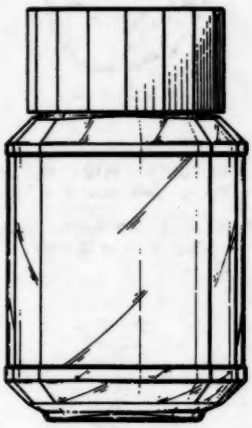
332,749
COMBINED BOTTLE AND CAP
Wolfgang Pisar, Duesseldorf, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
Filed Nov. 14, 1988, Ser. No. 271,184
Claims priority, application Fed. Rep. of Germany, May 13, 1988, MR 5710
Term of patent 14 years
U.S. Cl. D9—529



332,750
CAN
Thomas E. Moloney, Wheaton; Nelson N. Chernikoff, Richton Park; Edward K. Cassidy, Palatine, and John M. Mann, Downers Grove, all of Ill., assignors to American National Can Company, Chicago, Ill.
Continuation-in-part of Ser. No. 945,314, Dec. 22, 1986, Pat. No. Des. 306,972, which is a division of Ser. No. 594,610, Mar. 24, 1984, Pat. No. Des. 290,688, which is a continuation-in-part of Ser. No. 523,514, Aug. 15, 1983, Pat. No. Des. 283,011. This application May 12, 1989, Ser. No. 351,769
Term of patent 14 years
U.S. Cl. D9—556

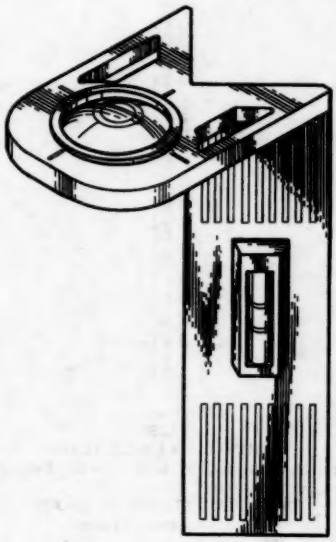


332,751
COMBINED JAR AND CAP
Markus Pischulti, Munich; Karl Schellhaass, Bremen, both of Fed. Rep. of Germany; Hajime Tajima, Ichikawa, Japan; Taku Satoh, Kawasaki, Japan, and Kazuo Honda, Tokyo, Japan, assignors to Kraft General Foods Ltd., Cheltenham, United Kingdom
Filed Jan. 3, 1991, Ser. No. 637,101
Claims priority, application United Kingdom, Jul. 3, 1990, 2007954
Term of patent 14 years
U.S. Cl. D9—560

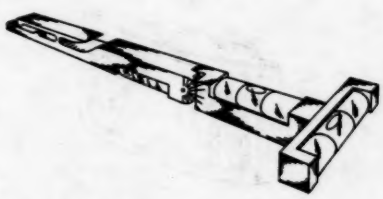


332,752
COMBINED BOTTLE AND CAP
Thierry Lemahieu, Boulogne Billancourt, France, assignor to Innovation Scientifique Dermatologique, Paris, France
Filed Oct. 2, 1990, Ser. No. 591,528
Claims priority, application France, Apr. 2, 1990, 902191
Term of patent 14 years
U.S. Cl. D9—567

332,753
LEVEL ADAPTER FOR DETERMINING PLUMB
Pierson Jones, 94 Lakepoint Dr., Harrisburg, Pa. 17111-2931
Filed Jul. 18, 1990, Ser. No. 553,694
Term of patent 14 years
U.S. Cl. D10—69



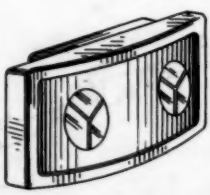
332,754
PIPE BENDING LEVEL
Philip D. Weldy, 509 Rivers Edge Ct., Mishawaka, Ind. 46544, and Robert Northern, 910 E. Madison St., South Bend, Ind. 46617
Filed Jul. 19, 1990, Ser. No. 554,844
Term of patent 14 years
U.S. Cl. D10—69



332,755
COMBINATION TOOL
Frederick L. Beckner, 13517 Poway Rd., SP25, Poway, Calif. 92064
Filed Sep. 23, 1991, Ser. No. 763,756
Term of patent 14 years
U.S. Cl. D10—69

332,756
PERSONAL SECURITY ALARM
Neil R. Taylor, Alameda, Calif., assignor to Egis Personal Safety Systems, Inc., San Jose, Calif.
Filed Sep. 17, 1991, Ser. No. 761,620
Term of patent 14 years
U.S. Cl. D10—106

332,757
SIGNAL LIGHT FOR TIMING A PULSE RATE
Frank W. Thomas, and Donald Brown, both of Chester, N.J., assignors to Pulse Lite, Inc., Chester, N.J.
Filed Jun. 28, 1990, Ser. No. 545,457
Term of patent 14 years
U.S. Cl. D10—114



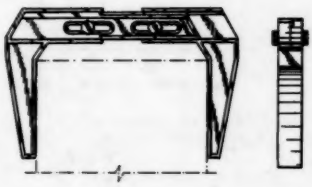
332,758
BELL
Huang C. Shyan, No. 1-1, Changma St., Hsiushui Hsiang, Changhua Hsien, Taiwan
Filed Jul. 24, 1991, Ser. No. 734,880
Term of patent 14 years
U.S. Cl. D10—116

332,759
PENDULUM FOR CLOCK
Hisako Sugano, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jan. 31, 1990, Ser. No. 473,363
Term of patent 14 years
U.S. Cl. D10—130

332,760
WATCHBAND
Andrew C. S. Tse, Kwai Chung, Hong Kong, assignor to HBL Ltd., Hong Kong
Filed Aug. 10, 1990, Ser. No. 565,410
Claims priority, application United Kingdom, Mar. 12, 1990, 2005351
Term of patent 14 years
U.S. Cl. D11—3

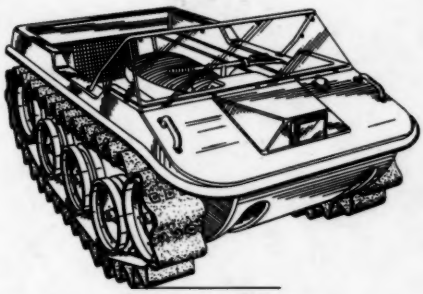
332,761
HALLOWEEN VAMPIRE DECORATION
Neal N. Mankey, Charlotte, N.C., assignor to Allied Plastics, Inc., Gastonia, N.C.
Filed Jun. 7, 1991, Ser. No. 711,738
Term of patent 14 years
U.S. Cl. D11—121

332,762
FLORAL DISPLAY SADDLE FOR GRAVE MARKERS
Lewis D. McCafferty, Jr., 921 W. Fourth, Hobart, Okla. 73651
Filed Oct. 26, 1990, Ser. No. 603,910
Term of patent 14 years
U.S. Cl. D11—164

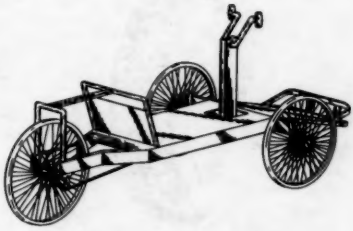


332,763
COMBINED DECORATION RIBBON AND STRING
Eiji Asano, 5-28, Nijigahama, Hiratsuka-shi, Kanagawa-ken, and Yoshiko Iwaki, 2-8-17-302, Minami Kugahara, Oota-ku, Tokyo, both of Japan
Filed Feb. 14, 1990, Ser. No. 480,199
Claims priority, application Japan, Aug. 15, 1989, 1-29833
Term of patent 14 years
U.S. Cl. D11—184

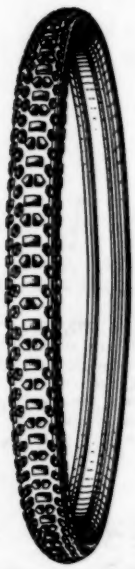
332,764
ALL TERRAIN MOTOR VEHICLE
Graeme A. Chandler, Morley, Australia, assignor to Altrack Limited, West Perth, Australia
Filed Mar. 4, 1991, Ser. No. 663,646
Claims priority, application Australia, Sep. 3, 1990, 2864/90
Term of patent 14 years
U.S. Cl. D12—3



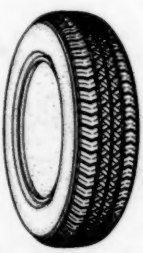
332,765
PARAPLEGIC'S TRICYCLE
Kelvin L. Tellinghuisen, 5100 E. Prospect, Sioux Falls, S. Dak. 57103
Filed Apr. 4, 1991, Ser. No. 680,272
Term of patent 14 years
U.S. Cl. D12—128



332,766
BICYCLE TIRE
Rio Marui, Kobe, Japan, assignor to Marui Ltd., Kobe, Japan
Filed Apr. 9, 1990, Ser. No. 506,366
Term of patent 14 years
U.S. Cl. D12—136

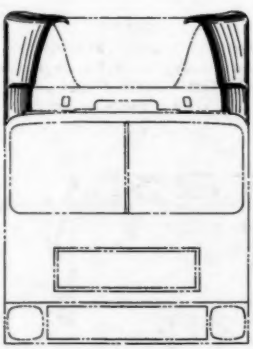


332,767
AUTOMOBILE TIRE
Toru Tsuda, and Toru Sasagawa, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Mar. 22, 1990, Ser. No. 498,142
Claims priority, application Japan, Sep. 27, 1989, 1-34928
Term of patent 14 years
U.S. Cl. D12—147

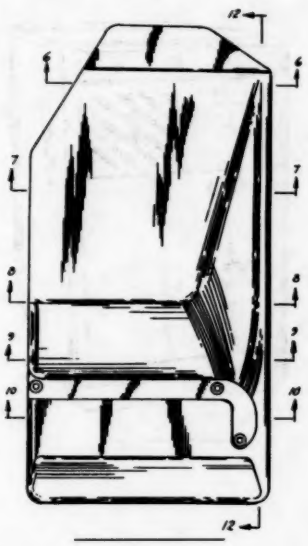


332,768
COMBINED AUXILIARY BAR AND ARM RESTS FOR ATTACHMENT TO A BICYCLE HANDLE BAR
Edward H. Giard, Jr., Oak Park, Ill., assignor to Profile for Speed, Chicago, Ill.
Continuation-in-part of Ser. No. 373,776, Jun. 29, 1989. This application Oct. 24, 1990, Ser. No. 602,869
The portion of the term of this patent subsequent to Mar. 12, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—178

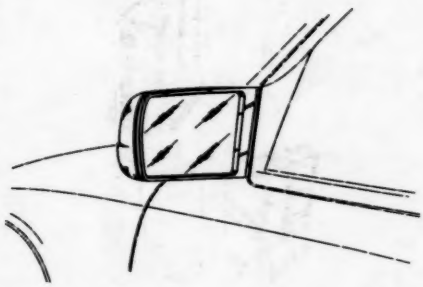
332,769
PAIR OF EXTENSION PANELS FOR A VEHICLE ROOF FAIRING
Kenton L. West, Fort Wayne, Ind., assignor to Navistar International Transportation Corpl, Chicago, Ill.
Filed Jul. 31, 1991, Ser. No. 738,502
Term of patent 14 years
U.S. Cl. D12—181



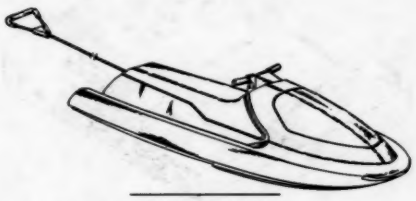
332,770
MUD GUARD
Thomas M. Rutter, Elkhart, Ind., and Douglas K. Ward, Toronto, Canada, assignors to Fab-Form Products, Inc., Elkhart, Ind.
Filed Oct. 11, 1990, Ser. No. 596,045
Term of patent 14 years
U.S. Cl. D12—185



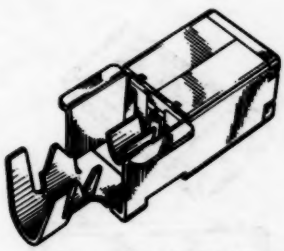
332,771
OUTSIDE REAR VIEW MIRROR
Bruno Sacco; Joseph Gallitzendörfer, and Peter Pfeiffer, all of Sindelfingen, Fed. Rep. of Germany, assignors to Mercedes Benz AG, Fed. Rep. of Germany
Filed Jun. 19, 1991, Ser. No. 717,716
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1990, M 90 08 364.4
Term of patent 14 years
U.S. Cl. D12—187



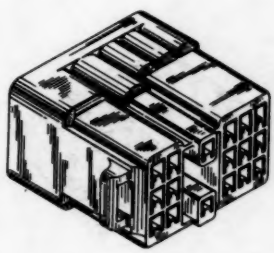
332,772
WATER CRAFT
Ronald O. Jones, Sr., P.O. Box 657, Kent, Wash. 98035, and Wayne T. Yutani, 10414 60th Ave. S., Seattle, Wash. 98178
Filed Aug. 1, 1990, Ser. No. 561,517
Term of patent 14 years
U.S. Cl. D12—307



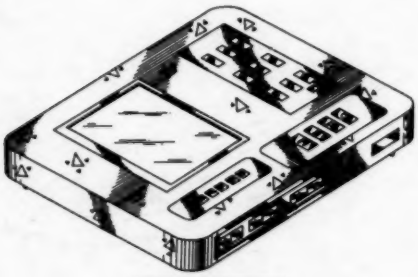
332,773
TERMINAL FOR AN ELECTRICAL CONNECTOR
Kensaku Sato, and Naohisa Nakata, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan
Filed Mar. 13, 1991, Ser. No. 668,467
Claims priority, application Japan, Sep. 14, 1990, 2-30768
Term of patent 14 years
U.S. Cl. D13—149



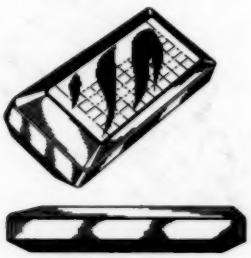
332,774
ELECTRIC CONNECTOR HOUSING
Hiroshi Watanabe, and Mari Harada, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Dec. 13, 1989, Ser. No. 449,734
Claims priority, application Japan, Jul. 20, 1989, 1-26610
Term of patent 14 years
U.S. Cl. D13—147



332,775
ELECTRONIC LANGUAGE TRANSLATOR
Peter J. Cavanaugh, 909 Ocean Rd. #4, Point Pleasant, N.J. 08743
Filed Jun. 5, 1990, Ser. No. 533,706
Term of patent 14 years
U.S. Cl. D14—100

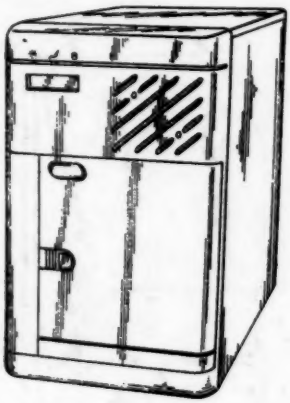


332,776
PORTABLE HAND-HELD PERSONAL COMPUTER
Edward J. Kelly, Grand Prairie; Clarence Zierhut, Richardson, and Joseph P. Howard, Euless, all of Tex., assignors to ElectroCom Automation, Inc., Arlington, Tex.
Filed Jul. 6, 1990, Ser. No. 548,776
Term of patent 14 years
U.S. Cl. D14—100

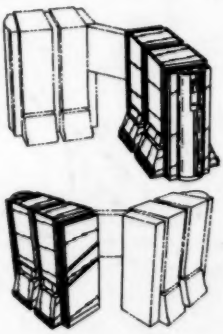


332,777
COMBINED PORTABLE HAND-HELD PERSONAL COMPUTER AND KEYBOARD CRADLE MOUNT
Edward J. Kelly, Grand Prairie; Clarence Zierhut, Richardson, and Joseph P. Howard, Euless, all of Tex., assignors to ElectroCom Automation, Inc., Arlington, Tex.
Filed Jul. 6, 1990, Ser. No. 548,777
Term of patent 14 years
U.S. Cl. D14—100

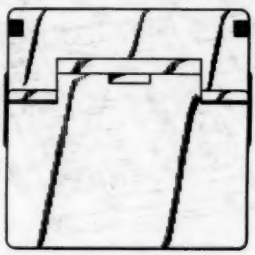
332,778
CENTRAL PROCESSOR UNIT FOR COMPUTER
Gong-Nan Wang, and Chien-Hsin Chung, both of Taipei, Taiwan, assignors to Aset Industrial Co. Ltd., Taipei, Taiwan
Filed Jan. 15, 1991, Ser. No. 641,363
Term of patent 14 years
U.S. Cl. D14—102



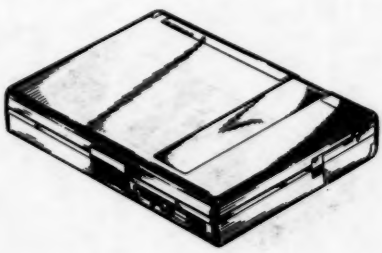
332,779
COMPUTER CABINET
Steven J. Dean, Chippewa Falls; David M. Morton, Eau Claire, both of Wis.; Eugene N. Reshanov, Golden Valley, and Eric J. Mueller, St. Paul, both of Minn., assignors to Cray Research Inc., Chippewa Falls, Wis.
Continuation of Ser. No. 391,371, Aug. 8, 1989, Pat. No. Des. 314,948. This application Feb. 4, 1991, Ser. No. 649,945
Term of patent 14 years
U.S. Cl. D14—102



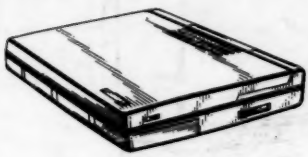
332,780
ELECTRONIC COMPUTER
Masaaki Iino, and Masaharu Mukasa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Dec. 6, 1989, Ser. No. 446,706
Claims priority, application Japan, Jun. 9, 1989, 1-21101
Term of patent 14 years
U.S. Cl. D14—106



332,781
HOUSING FOR NOTEBOOK COMPUTER
Peter K. Toedter, Trabuco Canyon, Calif., assignor to AST Research, Inc., Irvine, Calif.
Filed Oct. 19, 1990, Ser. No. 600,964
Term of patent 14 years
U.S. Cl. D14—106

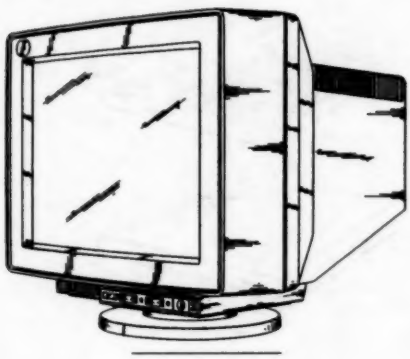


332,782
LAPTOP COMPUTER
Akira Kikuchi; Masahiro Suzuki, and Toru Ichihashi, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Oct. 24, 1990, Ser. No. 603,824
Claims priority, application Japan, May 31, 1990, 2-18271
Term of patent 14 years
U.S. Cl. D14—106



332,783
LAPTOP COMPUTER
Jonathan Krakower, Cupertino; Gavin R. Ivester, Palo Alto, and Robert D. Brunner, San Jose, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Dec. 18, 1990, Ser. No. 629,203
Term of patent 14 years
U.S. Cl. D14—106

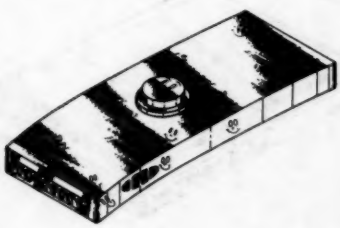
332,784
DISPLAY FOR COMPUTERS
John A. Wiseman, Hillsboro Beach, Fla., and Thomas E. Pangburn, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 16, 1991, Ser. No. 702,198
Claims priority, application United Kingdom, Nov. 21, 1990, 2011176
Term of patent 14 years
U.S. Cl. D14—113



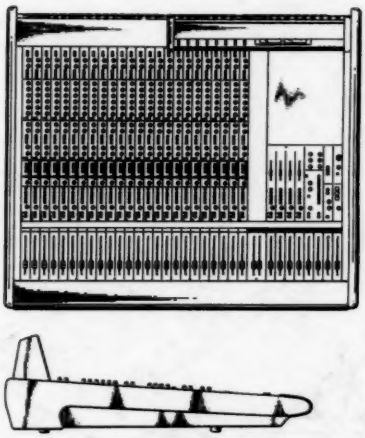
332,785
PORTABLE TELEPHONE
Albert L. Nagele, Wilmette, Ill., and Carl V. Novak, Pell Lake, Wis., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 26, 1991, Ser. No. 749,780
Term of patent 14 years
U.S. Cl. D14—138

332,786
BASE FOR A TELEPHONE SET
Jacques Gagnon, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Jun. 20, 1991, Ser. No. 718,148
Term of patent 14 years
U.S. Cl. D14—142

332,787
TAPE RECORDER
Larry Davis, 4904 Stanley Ave., Fort Worth, Tex. 76115-3821
Filed Jan. 9, 1990, Ser. No. 462,440
Term of patent 14 years
U.S. Cl. D14—160

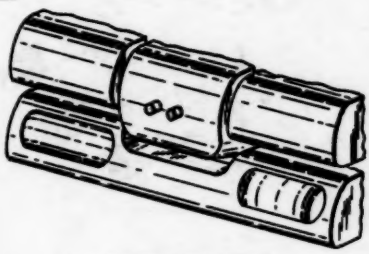


332,788
AUDIO MIXER
Masafumi Ito, Tokyo; Koji Suzuki, Tokorozawa; Shigeru Hasegawa, Tokyo, and Katsuhiro Takashima, Yokohama, all of Japan, assignors to Teac Corporation, Tokyo, Japan
Filed Apr. 9, 1990, Ser. No. 507,176
Claims priority, application Japan, Oct. 9, 1989, 1-36861
Term of patent 14 years
U.S. Cl. D14—217



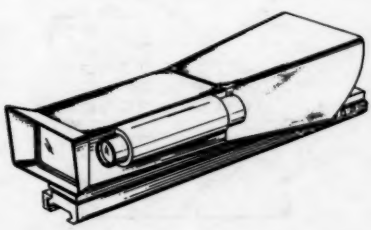
332,789
COMMUNICATION EQUIPMENT STAND FOR MOUNTING IN THE INTERIOR OF A VEHICLE
Roman P. Rak, Delta, Canada, assignor to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 12, 1991, Ser. No. 745,122
Term of patent 14 years
U.S. Cl. D14—251

332,790
CONTROL PUSHBUTTONS FOR A RADIO SYSTEM
John T. Gauthier, West Bloomfield; Robert P. Scott, Dearborn; Jeff Burgy, Farmington Hills, all of Mich.; John P. Stoddard, and Robin Sarre, both of London, United Kingdom, assignors to Ford Motor Company, Dearborn, Mich.
Filed Jul. 16, 1990, Ser. No. 553,502
Term of patent 14 years
U.S. Cl. D14—299

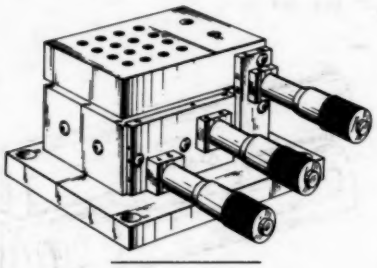


332,791
CONCRETE CRUSHER
Masaaki Kanzawa, Tokyo, Japan, assignor to Stone Import & Development Co., Ltd. and Kabushiki Kaisha Sanki Seikosho, both of Tokyo, Japan
Filed Sep. 10, 1990, Ser. No. 580,306
Term of patent 14 years
U.S. Cl. D15—32

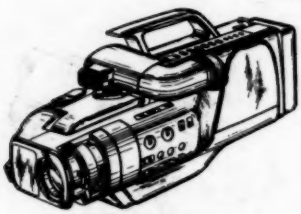
332,792
SMALL ARMS TELESCOPIC SIGHT
Richard Jörlöv, Lomma, Sweden, assignor to Sandberg Development AB, Malmo, Sweden
Filed Nov. 9, 1990, Ser. No. 611,282
Term of patent 14 years
U.S. Cl. D16—132



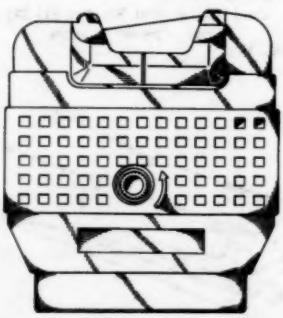
332,793
MICROMANIPULATOR
Henry Jankowiak, Ringwood, N.J., assignor to Servometer Corporation, Cedar Grove, N.J.
Filed Sep. 24, 1990, Ser. No. 586,715
Term of patent 14 years
U.S. Cl. D16—136



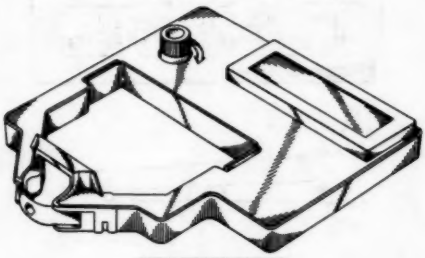
332,794
COMBINED VIDEO TAPE RECORDER AND CAMERA
Hiroto Takita, Kurume; Takanori Nishiyama, Koganei; Atuhiko Urushihara, Kokubunji; Akira Takahashi, Saitama, and Akira Ohkura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 22, 1991, Ser. No. 659,160
Claims priority, application Japan, Oct. 19, 1990, 2-34859
Term of patent 14 years
U.S. Cl. D16—202



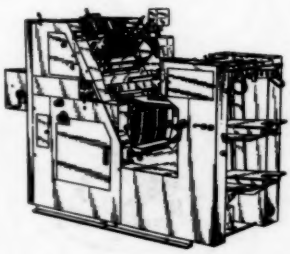
332,795
PRINTING RIBBON CARTRIDGE
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed May 11, 1990, Ser. No. 521,933
Term of patent 14 years
U.S. Cl. D18—12



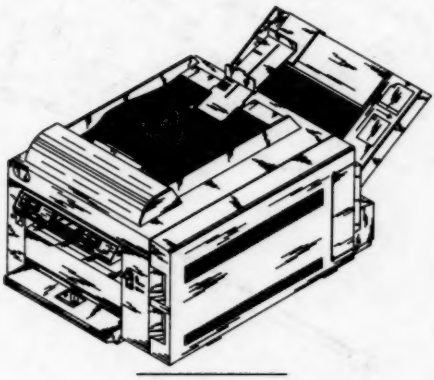
332,796
TYPING RIBBON CARTRIDGE
Gian F. De Falco, Samone; Paolo Prevignano, Burolo, and Francesco Tonengo, Chivasso, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Jan. 9, 1991, Ser. No. 639,161
Claims priority, application Italy, Jul. 9, 1990, 53133 B-90
Term of patent 14 years
U.S. Cl. D18—12



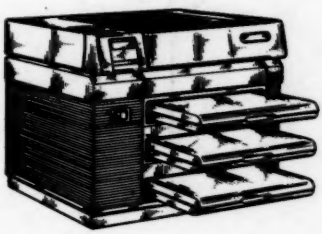
332,797
OFFSET PRINTING MACHINE
Takahiko Shinmoto, and Tetsuyuki Doi, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Dec. 6, 1991, Ser. No. 802,773
Claims priority, application Japan, Jan. 7, 1991, 3-16988
Term of patent 14 years
U.S. Cl. D18—53



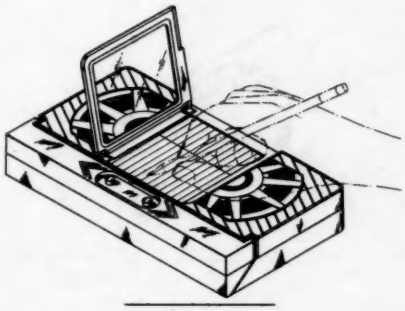
332,798
PRINTER
William R. Crowe, and Steven A. Silverstein, both of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.
Filed May 22, 1991, Ser. No. 703,993
Term of patent 14 years
U.S. Cl. D18—55



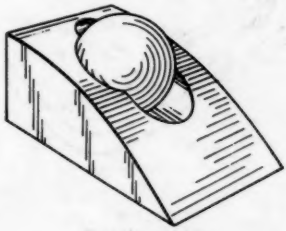
332,799
DESKTOP ELECTROPHOTOGRAPHIC PRINTER
Donald S. Goodrich, The Woodlands; Steven D. Gluskoter, Houston, and Randall W. Martin, The Woodlands, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Continuation of Ser. No. 636,968, Dec. 31, 1990, abandoned. This application Apr. 6, 1992, Ser. No. 870,182
Term of patent 14 years
U.S. Cl. D18—55



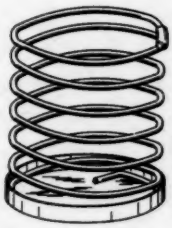
332,800
REVERSIBLE SCROLL DIRECTORY
Peter Gensemer, 4300 Brigantine Ave., A-4, Brigantine, N.J. 08203
Filed Aug. 15, 1990, Ser. No. 567,663
Term of patent 14 years
U.S. Cl. D19—76



332,801
CLIP DISPENSER
Richard F. M. Peersmann, ET Scheveningen, Netherlands, assignor to Pollyflame International B.V., Netherlands
Filed Apr. 22, 1991, Ser. No. 689,604
Claims priority, application World Int. Prop. O., Dec. 19, 1990, DM/018390
Term of patent 14 years
U.S. Cl. D19—75

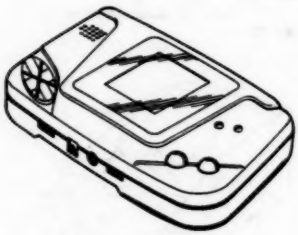


332,802
HOLDER FOR WRITING INSTRUMENTS
Steven E. Greenhut, 6368 NW. 23rd Way, Boca Raton, Fla. 33496, and Sheldon H. Goodman, 30905 Stratford, Solon, Ohio 44139
Filed Jun. 5, 1991, Ser. No. 710,913
Term of patent 14 years
U.S. Cl. D19—85

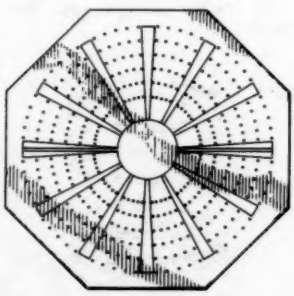


332,803
ADVERTISING BADGE
Judith K. Forslund, 14592 S. Kellogg School Rd., Hickory Corners, Mich. 49060
Continuation of Ser. No. 529,494, May 29, 1990, abandoned.
This application May 8, 1991, Ser. No. 697,288
Term of patent 14 years
U.S. Cl. D20—22

332,804
ELECTRONIC GAME HOUSING
Kim-Hung Li, Kowloon, Hong Kong, assignor to Bon Treasure Industrial Co., Ltd., Hong Kong
Filed Apr. 25, 1991, Ser. No. 691,097
Term of patent 14 years
U.S. Cl. D21—13



332,805
GAME BOARD
Robert W. Gard, 581 Roberta Avenue, Winnipeg, Manitoba, Canada R2K 0K9
Filed Oct. 29, 1990, Ser. No. 604,604
Claims priority, application Canada, Sep. 21, 1990, 21-09-90-9
Term of patent 14 years
U.S. Cl. D21—20

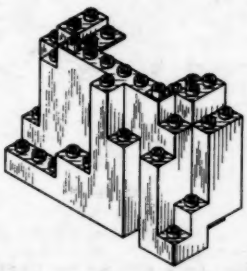


332,806
COMBINED BASEBALL GAME, SCORE PAD, AND PEN
Donald Blimline, R.R. 11, Box 765, Lenhartsville, Pa. 19534-9633
Filed Aug. 7, 1990, Ser. No. 563,976
Term of patent 14 years
U.S. Cl. D21—28

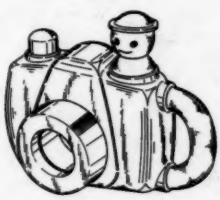
332,807
BUBBLE WAND
Margaret A. B. Neuroth, and Richard L. Neuroth, both of R.R. 1, Box 178-A, Epworth, Iowa 52045
Filed Jul. 30, 1991, Ser. No. 738,275
Term of patent 14 years
U.S. Cl. D21—61

332,808
BUBBLE WAND
Margaret A. B. Neuroth, and Richard L. Neuroth, both of R.R. 1, Box 178-A, Epworth, Iowa 52045
Filed Jul. 30, 1991, Ser. No. 738,281
Term of patent 14 years
U.S. Cl. D21—61

332,809
ELEMENT FOR A TOY BUILDING SET
Jens N. Knudsen, Billund, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 6, 1991, Ser. No. 789,111
Term of patent 14 years
U.S. Cl. D21—108



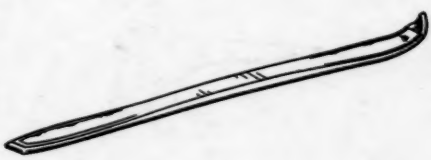
332,810
CAMERA TOY
Takayuki Fujieda, and Masami Shiraishi, both of Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan
Filed Oct. 10, 1991, Ser. No. 774,292
Claims priority, application Japan, Apr. 10, 1991, 3-10393
Term of patent 14 years
U.S. Cl. D21—110



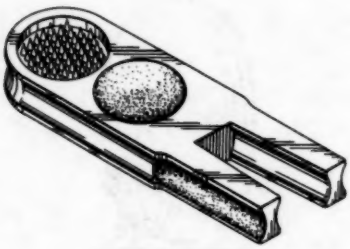
332,811
DISHED BASKETBALL GOAL
Rodney E. Walters, 8106 N. Callisch, Fresno, Calif. 93720
Filed Aug. 29, 1990, Ser. No. 574,916
Term of patent 14 years
U.S. Cl. D21—201

332,812
SET OF GOLF CLUB HEADS
Karsten Solheim, Phoenix, Ariz., assignor to Karsten Manufacturing Corporation, Phoenix, Ariz.
Filed Oct. 28, 1991, Ser. No. 784,042
Term of patent 14 years
U.S. Cl. D21—220

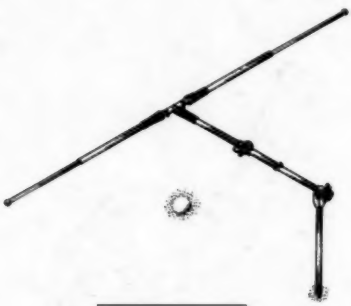
332,813
SKI
Myriam Serves, and Jean-Luc Diard, both of Annecy, France, assignors to Salomon S.A., Chavanod, France
Filed Jul. 23, 1990, Ser. No. 556,202
Claims priority, application Hague, Jan. 22, 1990, 015658
Term of patent 14 years
U.S. Cl. D21—229



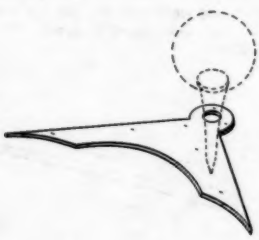
332,814
POOL CUE TIP TOOL
David L. Gossman, R.R. 1, Box 176, Milford, Iowa 51351
Filed Apr. 11, 1991, Ser. No. 683,664
Term of patent 14 years
U.S. Cl. D21—232



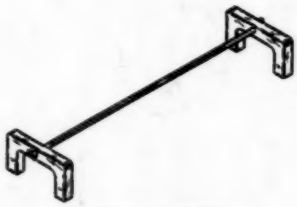
332,815
GOLF SWING TRAINER
Arthur V. Rivas, 1831 Montview St., San Antonio, Tex. 78213
Filed Aug. 6, 1990, Ser. No. 565,759
Term of patent 14 years
U.S. Cl. D21—234



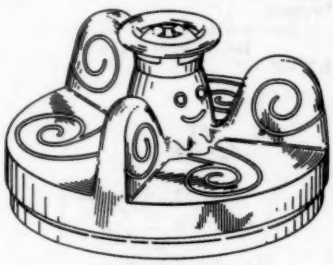
332,816
GOLF STANCE AND SWING GUIDE
Donnie W. Tarver, 614 W. 500 South, Brigham City, Utah 84302
Filed Oct. 1, 1990, Ser. No. 591,502
Term of patent 14 years
U.S. Cl. D21—234



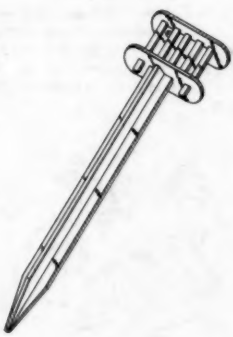
332,817
GOLF TRAINING AID
J. Robert Mullen, Wichita, Kans., assignor to J. Robert Mullen, Steamboat Springs, Colo.
Filed Oct. 3, 1990, Ser. No. 592,078
Term of patent 14 years
U.S. Cl. D21—234



332,818
MERRY-GO-ROUND TOY
John W. Spirk, Jr., and John R. Nottingham, both of Moreland Hills, Ohio, assignors to The Little Tikes Company, Hudson, Ohio
Filed Sep. 14, 1990, Ser. No. 582,549
Term of patent 14 years
U.S. Cl. D21—249



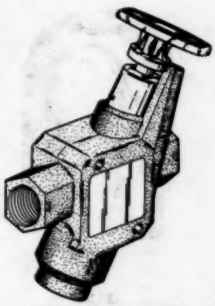
332,819
TIE STAKE
Byron A. Crowe, Thomaston, Me., assignor to Crowe Rope Company, Warren, Me.
Filed Jun. 4, 1990, Ser. No. 535,851
Term of patent 14 years
U.S. Cl. D21—255



332,820
FISHING BOBBER
James R. O'Brien, 4355 Pilgrim Hollow Ct., Brookfield, Wis. 53005, and Mark G. Sellers, W310 N6732 Chenaqua, Hartland, Wis. 53029
Filed Dec. 11, 1990, Ser. No. 625,604
Term of patent 14 years
U.S. Cl. D22—1446

332,821
FISHING POLE HOLDER
Ronald G. Padilla, 12029 W. Tanforan St., Morrison, Colo. 80465
Filed Oct. 5, 1987, Ser. No. 104,388
Term of patent 14 years
U.S. Cl. D22—147

332,822
VALVE
Kevin A. Reid, Asheville, N.C.; Karl Reid, Chicago, Ill., and Russell J. Cameron, Rochester, Mich., assignors to Ross Operating Valve Company, Troy, Mich.
Filed Jul. 10, 1990, Ser. No. 550,664
Term of patent 14 years
U.S. Cl. D23—233

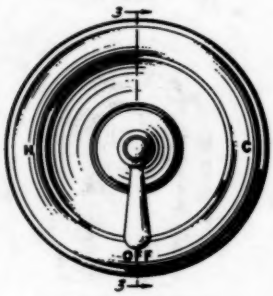


332,823
HANDLE FOR PLUMBING FIXTURES AND ACCESSORIES
Thomas A. Bonnell, Sheboygan, Wis., assignor to Kohler Co., Kohnler, Wis.
Filed Jun. 17, 1991, Ser. No. 716,602
Term of patent 14 years
U.S. Cl. D23—250

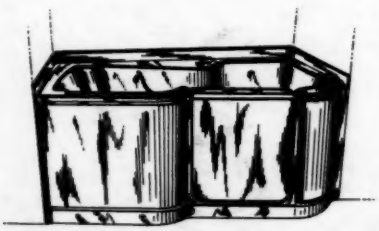
332,824
HANDLE FOR PLUMBING FIXTURES AND ACCESSORIES
Tom E. Robbins, San Leandro, Calif., assignor to Kallista, Inc., San Leandro, Calif.
Filed Apr. 25, 1991, Ser. No. 691,269
Term of patent 14 years
U.S. Cl. D23—252

332,825
HANDLE FOR PLUMBING FIXTURES AND ACCESSORIES
Thomas A. Bonnell, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jun. 17, 1991, Ser. No. 716,601
Term of patent 14 years
U.S. Cl. D23—252

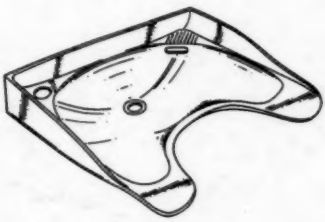
332,826
COMBINED SHOWER ESCUTCHEON AND WATER CONTROL HANDLE
Kevin W. Rosenbaum, Parma, Ohio, assignor to Moen Incorporated, Elyria, Ohio
Filed May 16, 1990, Ser. No. 523,934
Term of patent 14 years
U.S. Cl. D23—254



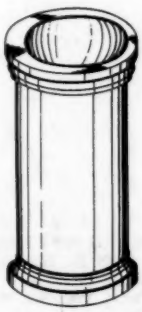
332,827
BATHTUB WITH ACCESS DOOR
Todd D. Dannenberg, and Robert C. Giese, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jun. 11, 1991, Ser. No. 714,774
Term of patent 14 years
U.S. Cl. D23—279



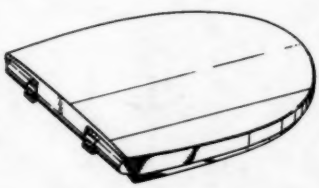
332,828
WASH BASIN
Jean-Pierre Schaerrer, 11, rue du Leman, 1201 Geneve, Switzerland
Filed Jul. 6, 1990, Ser. No. 548,771
Claims priority, application Switzerland, Jan. 11, 1990, 117945
Term of patent 14 years
U.S. Cl. D23—284



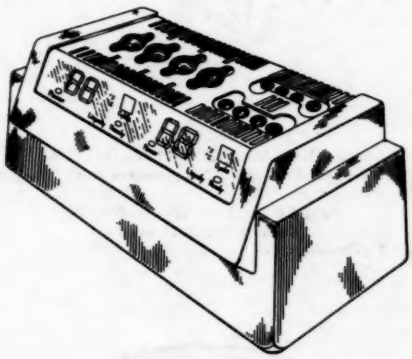
332,829
PEDESTAL SINK
Christine A. Belfor, 12 E. 86th St., New York, N.Y. 10028
Filed Jan. 3, 1991, Ser. No. 637,596
Term of patent 14 years
U.S. Cl. D23—292



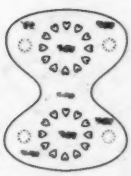
332,830
COMBINED TOILET SEAT AND COVER
Thomas Gerlach, Altensteig, Fed. Rep. of Germany, assignor to Pressalit A/S, Arhus C, Denmark
Filed Aug. 15, 1990, Ser. No. 567,545
Claims priority, application Denmark, Feb. 15, 1990, 0186/1990
Term of patent 14 years
U.S. Cl. D23—311



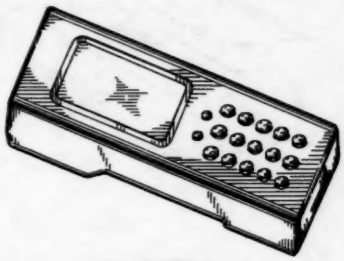
332,831
HEATING UNIT FOR USE IN MELTING AND KEEPING HYDROCOLLOID CARTRIDGES IN LIQUID FORM
Robert E. Burridge, Santa Barbara, Calif., assignor to Belport Co., Inc., Camarillo, Calif.
Filed Dec. 31, 1990, Ser. No. 636,366
Term of patent 14 years
U.S. Cl. D23—335



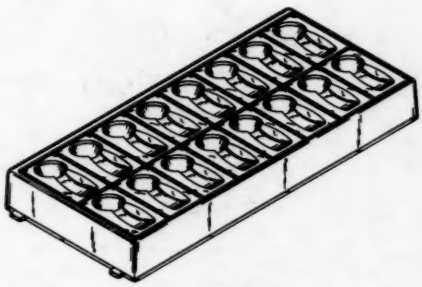
332,832
PANTY LINERS FOR TODDLERS
Monsita L. Powell, 34 Vaughn Dr., Denison, Tex. 75020
Filed Jul. 27, 1990, Ser. No. 558,387
Term of patent 14 years
U.S. Cl. D24—126



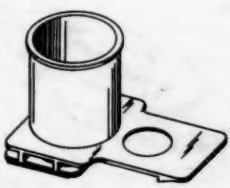
332,833
PORTABLE CLINICAL DIAGNOSTIC INSTRUMENT
Imants R. Lauks, Yardley; Joseph W. Rogers, Doylestown, both of Pa.; John Svezia, Millburn, N.J.; Henry J. Wieck, Plainsboro, N.J.; Michael Zelin, Plainsboro, N.J.; Philip Blyskal, Plainsboro, N.J., and Stephen A. Demusz, Ottsville, Pa., assignors to I-Stat, Princeton, N.J.
Filed Jul. 19, 1990, Ser. No. 555,544
Term of patent 14 years
U.S. Cl. D24—186



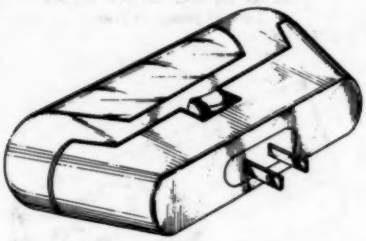
332,834
DISPOSABLE IMMUNOASSAY REACTION TRAY
Charles F. Hanna, Libertyville; Thomas F. Zurek, River Forest, and Omar S. Khalil, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.
Filed Aug. 21, 1990, Ser. No. 570,565
Term of patent 14 years
U.S. Cl. D24—223



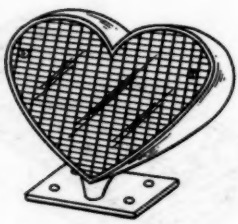
332,835
REAGENT CONTAINER
Joseph D. Antocci, Leominster, Mass., and George P. Anderson, Nashua, N.H., assignors to Iniziative Marittime 1991, s.r.l., Turin, Italy
Filed Feb. 1, 1990, Ser. No. 473,384
Term of patent 14 years
U.S. Cl. D24—224



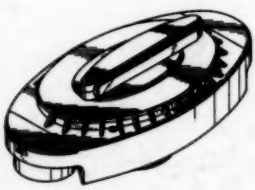
332,836
PLUG-IN FLUORESCENT LAMP
Byung I. Ham, 16550 E. Blackburn Dr., La Mirada, Calif. 90638
Filed May 2, 1991, Ser. No. 694,849
Term of patent 14 years
U.S. Cl. D26—26



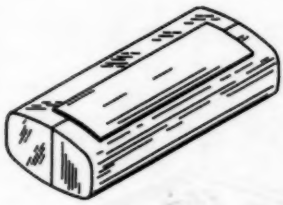
332,837
AUXILIARY VEHICLE BRAKE LIGHT
Tae H. Kim, Sambo Mansion 2-202, Yunsan 1-Dong, 580-4 Dongre-Ku, Pusan, Rep. of Korea
Filed Feb. 15, 1990, Ser. No. 480,505
Claims priority, application Rep. of Korea, Nov. 29, 1989, Des.89-16399
Term of patent 14 years
U.S. Cl. D26—32



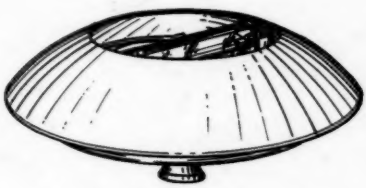
332,838
COMBINED SPEAKER AND AUXILIARY BRAKE LIGHT FOR VEHICLES
Alex Lu, Taipei Hsien, Taiwan, assignor to Dainty Electric Industries Co., Ltd., Taipei Hsien, Taiwan
Filed Apr. 24, 1991, Ser. No. 693,270
Term of patent 14 years
U.S. Cl. D26—34



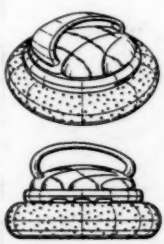
332,839
BATTERY POWERED PURSE OR CASE LIGHT
Kenneth W. Beckner, Jr., 3520 Cleveland Heights Blvd., Lakeland, Fla. 33802
Filed Jun. 24, 1991, Ser. No. 719,541
Term of patent 14 years
U.S. Cl. D26—37



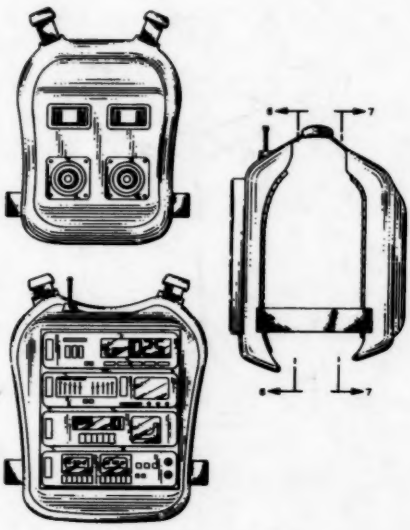
332,840
LAMP HEAD ASSEMBLY FOR TORCHIERE
Bertram Cohon, Hackensack, N.J., assignor to C. N. Burman Co., Paterson, N.J.
Filed Apr. 15, 1991, Ser. No. 685,508
Term of patent 14 years
U.S. Cl. D26—93



332,841
HOUSEHOLD SPONGE
Barrie Levison, 39 Beaumont Avenue, St Albans, Hertfordshire, AL1 4TW, United Kingdom
Filed Dec. 19, 1990, Ser. No. 631,771
Claims priority, application United Kingdom, Jun. 23, 1990, 2007768
Term of patent 14 years
U.S. Cl. D28—63

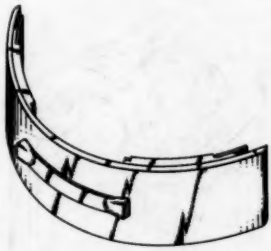


332,842
VEST MOUNTED SOUND SYSTEM
Bobby E. Floyd, 3/5 CAV BN CMR 452 Box 59, APO AE, 09045
Filed Mar. 22, 1990, Ser. No. 497,142
Term of patent 14 years
U.S. Cl. D29—11



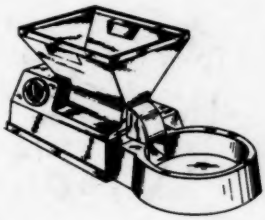
332,843
DIVING HELMET
Masahiko Kaburaki, Tokyo, Japan, assignor to Tohgun Kigyo Co., Ltd., Japan
Filed Dec. 7, 1990, Ser. No. 626,624
Claims priority, application Japan, Jun. 14, 1990, 2-19862
Term of patent 14 years
U.S. Cl. D29—15

332,844
FACE GUARD FOR A MOTORCYCLE HELMET
George E. Suplick, 10825 E. Moncure Rd., Ripon, Calif. 95366
Filed Nov. 27, 1989, Ser. No. 441,927
Term of patent 14 years
U.S. Cl. D29—16

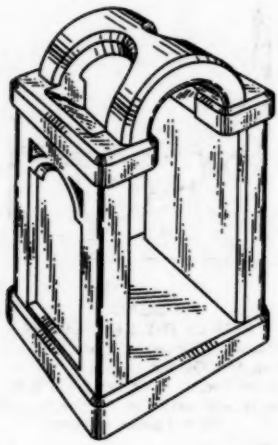


332,845
PAIR OF HOCKEY GLOVES
Robert M. Johnston, Toronto, Canada, assignor to Canstar Sports Group, Inc., Quebec, Canada
Filed Dec. 27, 1989, Ser. No. 458,795
Claims priority, application Canada, Nov. 22, 1989, 23-11-89-7
Term of patent 14 years
U.S. Cl. D29—22

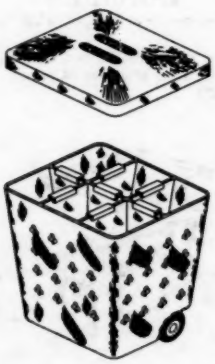
332,846
COMBINED AUTOMATIC PET FOOD DISPENSER AND ATTACHED BOWL
Moushegh Y. Geuvjehizian, 7507 N. First St., #103, Fresno, Calif. 93720
Filed Feb. 28, 1991, Ser. No. 661,635
Term of patent 14 years
U.S. Cl. D30—122



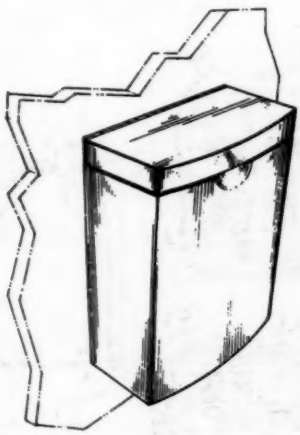
332,847
TRASH CAN ENCLOSURE
David Livingston, P.O. Box 263, Corvallis, Oreg. 97339
Filed Feb. 5, 1991, Ser. No. 650,649
Term of patent 14 years
U.S. Cl. D34—5



332,848
COMPARTMENTED TRASH RECEPTACLE
Robert T. Williams, 209 Ohio Ave., West Glen Falls, N.Y. 12804
Filed Jun. 3, 1991, Ser. No. 709,402
Term of patent 14 years
U.S. Cl. D34—5

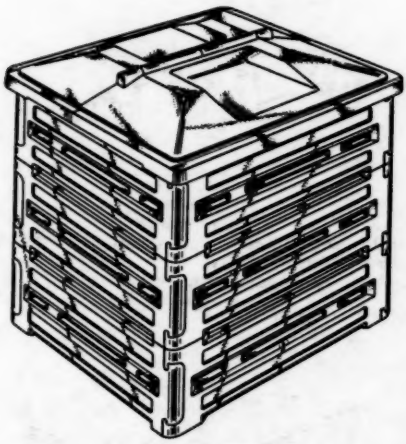


332,849
NAPKIN DISPOSAL
David M. Hines, Santa Ana, Calif., assignor to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.
Filed Nov. 15, 1991, Ser. No. 792,774
Term of patent 14 years
U.S. Cl. D34—6

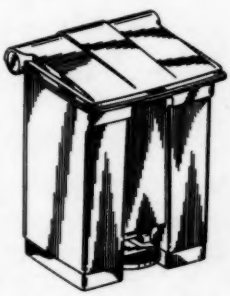


332,850
COMPARTMENTALIZED TRASH CONTAINER
Bernd Brüssing, Ulm, Fed. Rep. of Germany, assignor to Hans Friedrich Hefendehl, Kierspe, Fed. Rep. of Germany
Filed Feb. 6, 1991, Ser. No. 653,251
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1990, M 90 05 299.4
Term of patent 14 years
U.S. Cl. D34—7

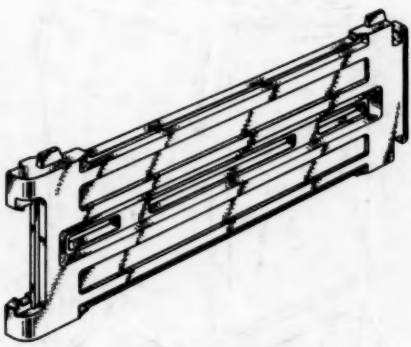
332,851
COMPOSTER
Richard Long, San Francisco, Calif., assignor to Smith & Hawken, Mill Valley, Calif.
Filed Mar. 22, 1991, Ser. No. 674,032
Term of patent 14 years
U.S. Cl. D34—7



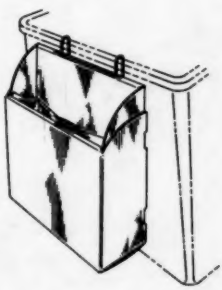
332,852
STEP-ON WASTE RECEPTACLE
Paul E. Delmerico, Winchester, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Jun. 25, 1991, Ser. No. 720,922
Term of patent 14 years
U.S. Cl. D34—9



332,853
COMPOSTER PANEL
Richard Long, San Francisco, Calif., assignor to Smith & Hawken, Mill Valley, Calif.
Filed Apr. 5, 1991, Ser. No. 681,339
Term of patent 14 years
U.S. Cl. D34—10

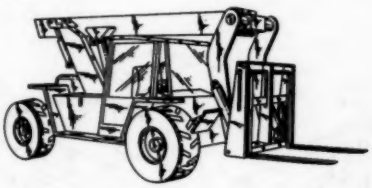


332,854
CADDY FOR ATTACHMENT TO A WASTE RECEPTACLE
Rebecca L. Waterston, Plymouth, and Mark S. Stoll, Deephaven, both of Minn., assignors to Liberty Diversified Industries, New Hope, Minn.
Filed Apr. 11, 1991, Ser. No. 683,673
Term of patent 14 years
U.S. Cl. D34—10

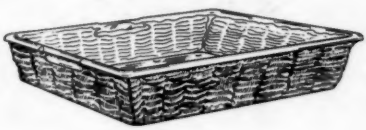


332,855
MEDICAL TROLLEY
Alistair G. Royse, Bulleen, Australia, and David J. Auld, Ayr, Scotland, assignors to Australian Medical Technology Pty. Ltd., Bulleen, Australia
Filed Jan. 25, 1991, Ser. No. 646,055
Claims priority, application Australia, Jul. 31, 1990, 2451/1990
Term of patent 14 years
U.S. Cl. D34—19

332,856
FORKLIFT VEHICLE
David R. Krayem, Tedbury, Great Britain, assignor to GCM 600 Limited, Middlesex, Great Britain
Filed Jan. 31, 1991, Ser. No. 648,357
Claims priority, application United Kingdom, Aug. 17, 1990, 2009092
Term of patent 14 years
U.S. Cl. D34—28



332,857
WICKER BASKET
Darrell L. Cooper, Fort Worth, Tex., assignor to The Marco Company, Fort Worth, Tex.
Filed Apr. 30, 1991, Ser. No. 693,411
Term of patent 14 years
U.S. Cl. D34—42



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF JANUARY, 1993

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Saari, Risto V. J., 5,181,396, Cl. 62-541.000.

AAI Corporation: *See*—
Layton, Mark R.; Palmer, Ramon L., Jr.; and Smith, Lester L., 5,181,851, Cl. 434-226.000.

AB Formplast: *See*—
Kvanna, Klas-Goran, 5,181,639, Cl. 224-328.000.

AB Ingredients Ltd.: *See*—
Wollard, Douglas J., 5,181,661, Cl. 239-704.000.

Abatis Medical Technologies Limited: *See*—
McEwen, James A., 5,181,522, Cl. 128-748.000.

Abbott Laboratories: *See*—
Kleinert, Hollis D., 5,182,266, Cl. 514-18.000.

Abdi, Behrooz: *See*—
Hanna, John E.; and Abdi, Behrooz, 5,182,476, Cl. 307-491.000.

Abe, Hajime: *See*—
Ozawa, Koichi; Abe, Hajime; and Owashi, Yutaka, 5,182,117, Cl. 425-144.000.

Abe, Hiroomi; Nagaoka, Kenji; Nishio, Taichi; Shinonaga, Hideo; and Sanada, Takashi, to Sumitomo Chemical Company, Limited. Thermoplastic resin composition. 5,182,336, Cl. 525-132.000.

Abe, Hiroshi, to Asahi Seiko Kabushiki Kaisha. Outlet device for coin payout hoppers. 5,181,881, Cl. 453-57.000.

Abe, Seiji: *See*—
Yanaba, Shigeru; Shiobara, Masataka; Masamizu, Koji; Morohara, Kiyoshi; and Abe, Seiji, 5,182,044, Cl. 252-174.240.

Abe, Shigenobu, to Kabushiki Kaisha Showa Seisakusho. Vehicle height adjusting device for attachment to a hydraulic shock absorber for vehicles. 5,181,696, Cl. 267-64.170.

Abe, Shinya: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.

Abe, Takao: *See*—
Kitamura, Shigehiro; Watanabe, Hiroshi; and Abe, Takao, 5,182,160, Cl. 428-195.000.

Abe, Tsutomu: *See*—
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.

Miyake, Hiroyuki; Abe, Tsutomu; Ito, Hisao; Hotta, Hiroyuki; Shimizu, Yasumoto; and Sakai, Yoshihiko, 5,182,625, Cl. 257-443.000.

Abe, Yoshio: *See*—
Taguchi, Kazuo; Onisawa, Kenichi; Fuyama, Moriaki; Tamura, Katsumi; Abe, Yoshio; Nakayama, Takahiro; Hashimoto, Kenichi; and Sato, Akira, 5,182,491, Cl. 313-503.000.

Abekas Video Systems, Inc.: *See*—
Antonio, Robert C.; Bennett, Phillip P.; and Andrews, Mark R., 5,182,633, Cl. 358-11.000.

Abraham, Anthony W., to Wynn's Climate Systems, Inc. Refrigerant recovery unit with pure system. 5,181,388, Cl. 62-77.000.

Acoustic Imaging Technologies Corporation: *See*—
Shen, Michael C. S.; and Zobkiw, Christopher P., 5,182,728, Cl. 367-7.000.

Adachi, Hiroyuki: *See*—
Yamamoto, Akira; Kimura, Shigeo; Kusaka, Kensaku; Maruta, Hidekazu; and Adachi, Hiroyuki, 5,182,606, Cl. 355-289.000.

Adachi, Keiichi: *See*—
Inagaki, Yoshio; Adachi, Keiichi; and Yabe, Masao, 5,182,186, Cl. 430-270.000.

Adelman, Roger; and Duty, Michael S., to Newtron Products Company. Smoke alarm and air cleaning device. 5,182,542, Cl. 340-521.000.

Adidas Sarragan France: *See*—
Donntag, Jean-Marie; and Casper, Jacques, 5,181,717, Cl. 273-58.0BA.

Adir et Compagnie: *See*—
Lesieur, Daniel; Lespagnol, Charles; and Bonnet, Jacqueline, 5,182,278, Cl. 514-233.800.

Advanced Flow Control AFC Aktiebolag: *See*—
Bengtsson, Bengt-Goran , 5,182,704, Cl. 364-148.000.

Advanced Power Technology, Inc.: *See*—
Meyer, Theodore O., 5,182,234, Cl. 437-233.000.

Advanced Therapeutics, Inc.: *See*—
Larson, Randall; and Larson, Gloria A., 5,181,895, Cl. 482-93.000.

Aebischer, Patrick; and Winn, Shelley R., to Boston University Research Foundation. In vivo delivery of active factors by co-cultured cell implants. 5,182,111, Cl. 424-424.000.

Aeppli, Kurt, to Zellweger Uster AG. Method for setting the sensitivity limits of electronic yarn clearers, and device for carrying out the method. 5,181,374, Cl. 57-264.000.

Aerosol Disposal Systems, Inc.: *See*—
Isaac, J. Wayne, 5,181,462, Cl. 100-98.00R.

Aerospatial Societe Nationale Industrielle: *See*—
Favre, Christian; and Van den Bossche, Dominique, 5,181,380, Cl. 60-405.000.

Aerospatiale Societe Nationale Industrielle: *See*—
Martin, Guy E., 5,181,809, Cl. 408-3.000.

Agan, George E. Exercise apparatus for use for doing inclined push-up. 5,181,897, Cl. 482-141.000.

Agence Spatiale Europeenne: *See*—
Panin, Fabio, 5,181,430, Cl. 74-99.00R.

Agfa-Gevaert N. V.: *See*—
Degrauwe, Dirk M.; Raemdonck, Marcel A.; and Geleyns, Eduard A., 5,181,963, Cl. 118-325.000.

Aghachi, Abraham. Cleaning cartridge for video games and computers. 5,181,292, Cl. 15-236.080.

Agnew, James W.: *See*—
Allwin, Roger P.; and Agnew, James W., 5,181,570, Cl. 166-381.000.

Agusta S.p.A.: *See*—
Pancotti, Santino, 5,181,829, Cl. 416-134.00A.

Ahlstrom Pyropower Corporation: *See*—
Gounder, Ponnusami K., 5,181,381, Cl. 60-648.000.

Ahmed, Nahed K., to Marion Merrell Dow, Inc. Pharmaceutical composition comprising daunorubicin potentiated with 2,4,5-tri (4-methoxyphenyl)-4,5-dihydroimidazole. 5,182,268, Cl. 514-39.000.

Ahrens, Kurt-Henning: *See*—
Morsdorf, Peter; Engler, Heidrun; Schickaneder, Helmut; and Ahrens, Kurt-Henning, 5,182,294, Cl. 514-341.000.

AIP inc.: *See*—
Wellman, Charles G., 5,181,438, Cl. 73-107.100.

Air Products and Chemicals, Inc.: *See*—
Iacoveillo, John G.; and Horwat, David W., 5,182,328, Cl. 524-803.000.

Aizawa, Chikara: *See*—
Tamura, Shinichi; Kurata, Takeshi; Aizawa, Chikara; and Nagamine, Takashi, 5,182,109, Cl. 424-92.000.

Akaike, Masatake: *See*—
Kishi, Fumio; Akaike, Masatake; Yamamoto, Keisuke; Motoi, Taiko; Kaneko, Norio; Iwatate, Fujio; Ohmi, Kazuaki; Kawasaki, Takehiko; and Shinjou, Atsuko, 5,182,253, Cl. 505-1.000.

Akamatsu, Masuo: *See*—
Suzuki, Masayoshi; and Akamatsu, Masuo, 5,181,420, Cl. 73-204.150.

Akasaka, Kozo: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.

Aki, Shota: *See*—
McKeeman, William M.; and Aki, Shota, 5,182,806, Cl. 395-700.000.

Akioka, Masahiro: *See*—
Ashikawa, Noboru; Yaguchi, Bunsho; Yasuda, Toyoshi; Takano, Masami; Ohhashi, Akihito; Shimada, Hiroyuki; and Akioka, Masahiro, 5,181,893, Cl. 475-203.000.

Akiyama, Hajime; and Kondoh, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Insulated gate bipolar transistor and method of manufacturing the same. 5,182,626, Cl. 257-142.000.

Akthar, Tarranum: *See*—
Leondaridis, Paul; Vendel, Albert S.; and Akthar, Tarranum, 5,182,088, Cl. 423-210.000.

Akutsu, Mitsuo; and Iwakura, Syuji, to Asahi Denka Kogyo Kabushiki Kaisha. Method for preventing the discoloration of paper and paper treated to prevent discoloring. 5,181,988, Cl. 162-135.000.

Akutsu, Tsuyoshi: *See*—
Notagashira, Hidefumi; and Akutsu, Tsuyoshi, 5,182,674, Cl. 359-694.000.

Akzo N.V.: *See*—
Kim, Ki-Soo, 5,182,394, Cl. 549-557.000.

Aladdin Synergetics, Inc.: *See*—
Oakes, Roger K.; and Cundiff, Kevin B., 5,182,438, Cl. 219-386.000.

Albaugh, Pamela, to Neurogen Corporation. Certain oxazoloquinolinones; a new class of GABA brain receptor ligands. 5,182,290, Cl. 514-293.000.

Albaugh, Pamela; and Hutchinson, Alan J., to Neurogen Corporation. Certain imidazoquinoxalinones; a new class of gaba brain receptor ligands. 5,182,386, Cl. 540-350.000.

Alber, Gerhard G. A.: *See*—
Jack, Kurt K. J.; and Alber, Gerhard G. A., 5,182,428, Cl. 219-121.630.

Alberee Ltd., Inc.: *See*—
Lee, Albert, 5,182,015, Cl. 210-94.000.

Albiez, Alfred, to Alfit Aktiengesellschaft. Furniture element. 5,181,772, Cl. 312-348.400.

Albrectsen, Sten: *See*—
Hedegaard, Kurt; Albrectsen, Sten; and Hansen, Jens, 5,182,081, Cl. 422-56.000.

Alcatel Cit: *See*—
Baret, Gilles; Chicherie, Jean-Pierre; and Paquet, Jean-Marc, 5,181,414, Cl. 73-40.700.

Alcatel N.V.: *See*—
Bui-Hai, Nhu, 5,182,569, Cl. 343-781.0CA.

Alcon Laboratories, Inc.: *See*—
DeSantis, Louis, Jr.; and Jani, Rajni, 5,182,102, Cl. 424-78.100.

Alderson, Gerald L.: *See*—
Lew, Chel W.; Aufdemorte, Thomas B.; McGuff, Howard S.; and Alderson, Gerald L., 5,181,505, Cl. 128-200.260.

Alexander, Rhonda L.; Irrgang, Michael E.; and Kirchner, John A., to Texas Instruments Incorporated. Computer-aided decision making with a symbolic spreadsheet. 5,182,793, Cl. 395-13.000.

Alfit Aktiengesellschaft: *See*—
Albiez, Alfred, 5,181,772, Cl. 312-348.400.

Alicke, Gerhard: *See*—
Voelker, Heinz; Alicke, Gerhard; Schuch, Horst; Weilbacher, Manfred; and Weber, Reinhold, 5,182,308, Cl. 521-79.000.

Alkermes, Inc.: *See*—
Friden, Phillip M., 5,182,107, Cl. 424-85.910.

Allen-Bradley Company, Inc.: *See*—
Gasperi, Michael L.; and Davis, Wesley, 5,182,794, Cl. 395-23.000.
Stroud, James W., III; and Dodds, John F., 5,182,716, Cl. 364-476.000.

Allen, Harold O., to 501 Amlite Corporation. Method of applying a bound particulate rubber outdoor surface. 5,182,137, Cl. 427-138.000.

Allen, Timothy R., to Cloyes Gear & Products. Timing gear having different keyways. 5,181,432, Cl. 74-395.000.

Allen, William E.: *See*—
Henderson, Daniel E.; and Allen, William E., 5,182,501, Cl. 318-443.000.

Aliet, Bernard; and Kawashima, Eric H., to Biogen, Inc. Expression systems for overproduction of desired proteins. 5,182,196, Cl. 435-69.500.

Allied-Signal Inc.: *See*—
Buchmann, Oscar A., 5,181,384, Cl. 62-12.000.
Van Der Puy, Michael, 5,182,042, Cl. 252-172.000.

Allison, Joseph W.; Richter, Jan; Childers, Craig M.; Smalley, Dennis R.; Hull, Charles W.; and Jacobs, Paul F., to 3D Systems, Inc. Method of making a three-dimensional object by stereolithography. 5,182,055, Cl. 264-22.000.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 5,182,078, Cl. 419-9.000.

Allsop, Inc.: *See*—
Allsop, Ivor J.; Holz, Harold F.; and Clausen, Eivind, 5,181,822, Cl. 414-462.000.

Allsop, Ivor J.; Holz, Harold F.; and Clausen, Eivind, to Allsop, Inc. Articulated support rack for vehicles. 5,181,822, Cl. 414-462.000.

Allwin, Roger P.; and Agnew, James W., to MWL Tool Company. Liner hanger assembly. 5,181,570, Cl. 166-381.000.

Almen, Peter D., to Summers Manufacturing Company, Inc. Seed bed packer implement. 5,181,573, Cl. 172-459.000.

Alpine Electronics, Inc.: *See*—
Tokuyama, Takashi, 5,182,559, Cl. 341-144.000.

Alps Electric Co., Ltd.: *See*—
Kato, Masakazu; Ishikawa, Takatoshi; and Ishikawa, Tetsuo, 5,182,574, Cl. 346-76.0PH.

Aluminum Company of America: *See*—
Misra, Chanakya, 5,182,410, Cl. 556-187.000.

Amaral, Everson, to McNeil-PPC, Inc. Anatomically shaped absorbent pad. 5,181,563, Cl. 604-385.200.

American Cyanamid Company: *See*—
Condon, Michael E.; Karp, Gary M.; and Birk, Jeffrey H., 5,182,397, Cl. 546-15.000.
Tobkes, Martin; Diaz, Simon; and Krishnan, Lalitha, 5,182,374, Cl. 536-16.500.
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 5,182,207, Cl. 435-253.500.

American Home Products Corporation: *See*—
Stack, Gary P., 5,182,292, Cl. 514-321.000.

American Lighting Fixture Corp.: *See*—
Segill, William; Segill, Mark E.; and Dangelo, Michael, 5,181,777, Cl. 362-405.000.

American Medical Electronics, Inc.: *See*—
Erickson, John H.; and Tepper, John C., 5,181,902, Cl. 600-13.000.

American Standard Inc.: *See*—
Kolada, Paul P., 5,181,285, Cl. 4-657.000.
Ohaus, Karl G., 5,182,116, Cl. 425-125.000.

American Tourister, Inc.: *See*—
Carpenter, Lester E.; Schmitt, Wayne I.; Snell, Laurence; Bieber, David; Stucke, Donald W.; and Waltzer, Jeremy S., 5,181,590, Cl. 190-18.00A.

Ames, Ronald M.: *See*—
Pollack, Richard S.; Phelan, John R.; Ames, Ronald M.; Starkey, Gene R.; Brown, Robert W.; Belski, Gary T.; and Dunn, William F., 5,181,975, Cl. 152-152.100.

AMF Bowling, Inc.: *See*—
Stephens, Michael W., 5,181,716, Cl. 273-51.000.

Amgen Inc.: *See*—
Schea, Henry E., III; and Cleary, Kenneth M., Jr., 5,181,394, Cl. 62-371.000.

Amoco Corporation: *See*—
Andrusko, Frank G., 5,182,162, Cl. 428-219.000.
Anthon, Douglas W.; Clark, John H.; Johnson, Leo; and Pier, Timothy J., 5,182,759, Cl. 372-72.000.
Arzoumanidis, Gregory G.; and Peaches, Christine, 5,182,245, Cl. 502-115.000.

AMP Incorporated: *See*—
Hawk, Gary W.; Hayes, Earl J.; Hunt, Alexander, III; and Ward, Bobby G., 5,181,862, Cl. 439-595.000.
Hayes, Earl J., Sr., 5,181,865, Cl. 439-752.000.
Joyce, James L., Jr.; Jones, Warren C.; Rowlette, John R., Sr.; MacInnes, David F., Jr.; and Vyas, Navin N., 5,182,050, Cl. 252-500.000.
Layser, Steven M., 5,181,857, Cl. 439-157.000.
Matz, Bret A.; Babu, K. C.; and Kumar, Hemant, K. R., 5,181,858, Cl. 439-188.000.

Anadrill, Inc.: *See*—
Askew, Warren E.; and Eddison, Alan, 5,181,576, Cl. 175-61.000.

Anders, Walter G., to Diebold, Incorporated. Floating accelerator ring. 5,181,807, Cl. 406-190.000.

Anders, Walter G.: *See*—
Grosswiller, Leo J.; Theriault, F. Michael; Mannella, Lawrence F.; and Anders, Walter G., 5,181,805, Cl. 406-189.000.
Grosswiller, Leo J.; Theriault, F. Michael; Mannella, Lawrence F.; and Anders, Walter G., 5,181,806, Cl. 406-189.000.

Andersen, Eugene C.; and Balk, Gary W. Farm implement row guidance device. 5,181,572, Cl. 172-6.000.

Anderson, George E., to Crown Iron Works Company. Fastener. 5,181,817, Cl. 411-369.000.

Anderson, J. Edward C.; and Jeromson, James R., Jr., to Milbar Corporation. Incremental dispensing device. 5,181,636, Cl. 222-389.000.

Anderson, James D.: *See*—
Uren, Dean P.; and Anderson, James D., 5,181,332, Cl. 36-114.000.

Anderson, John J.: *See*—
Pirl, William E.; Smith, Edward H.; Roth, Charles H., Jr.; Lutz, Rodney A.; and Anderson, John J., 5,182,429, Cl. 219-121.630.

Ando, Koichi, to NEC Corporation. Logic circuit with bipolar CMOS configuration. 5,182,472, Cl. 307-446.000.

Ando, Nobuo: *See*—
Shibata, Akiji; and Ando, Nobuo, 5,182,667, Cl. 359-124.000.

Andoh, Nobuaki; Kohda, Kenji; Toyama, Tsuyoshi; Noguchi, Kenji; and Kobayashi, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Nonvolatile semiconductor memory device with reduced variation in source potential of floating gate type memory transistor and operating method therefor. 5,182,725, Cl. 365-185.000.

Andrews, Howard W., Jr.; Kowalski, John A.; and Wahl, Friedrich G., to Rubbermaid Commercial Products Inc. Connector clip for waste receptacles. 5,181,297, Cl. 24-336.000.

Andrews, Mark R.: *See*—
Antonio, Robert C.; Bennett, Phillip P.; and Andrews, Mark R., 5,182,633, Cl. 358-11.000.

Andritz Sprout-Bauer, Inc.: *See*—
Kohler, Gregory R., 5,181,664, Cl. 241-261.300.

Andrusko, Frank G., to Amoco Corporation. Self-bonded nonwoven web and net-like web composites. 5,182,162, Cl. 428-219.000.

Anstey, Henry D.; Ardueser, William A.; and Rumph, George W., to Deere & Company. Housing for holding a supply roll of large round bale wrap material. 5,181,368, Cl. 53-587.000.

ANT Nachrichtentechnik GmbH: *See*—
Heichler, Johannes, 5,182,745, Cl. 370-85.100.

Anthon, Douglas W.; Clark, John H.; Johnson, Leo; and Pier, Timothy J., to Amoco Corporation. Apparatus and method for pumping of a weakly absorbing lasant material. 5,182,759, Cl. 372-72.000.

Antonelli, Joseph A.; Lin, Tyau-Jeen; Yang, Duck J.; and Yasuda, Hirotsugu, to Du Pont de Nemours, E. I., and Company. Method of coating metal using low temperature plasma and electrodeposition. 5,182,000, Cl. 204-181.100.

Antonio, Robert C.; Bennett, Phillip P.; and Andrews, Mark R., to Abekas Video Systems, Inc. Video sample rate converter. 5,182,633, Cl. 358-11.000.

Aoki, Makoto: *See*—
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.

Aoki, Yoko: *See*—
Osada, Takahiro; and Aoki, Yoko, 5,182,324, Cl. 524-379.000.

Aoshima, Toshiharu: *See*—
Izumi, Masahiro; Aoshima, Toshiharu; Ide, Yutaka; Terawaki, Ritsuko; and Hosoya, Hideaki, 5,181,491, Cl. 123-336.000.

Aoyama, Yuji; and Kumai, Katsutoshi, to Taiyo Steel Co., Ltd. Conductive and corrosion-resistant steel sheet. 5,182,171, Cl. 428-623.000.

APA Optics, Inc.: *See*—
Khan, Muhammad A.; Kuznia, Jonathon N.; and Van Hove, James M., 5,182,670, Cl. 359-359.000.
Apgar, William J., to Sea Shelf Engineering Pty Ltd. Wind driven craft. 5,181,674, Cl. 244-47.000.
Appalucci, Lawrence C.: *See*—
Aquilera, Luis; Appalucci, Lawrence C.; and Mazoki, Gary, 5,182,544, Cl. 340-572.000.
Applied Biosystems, Inc.: *See*—
Wiktorowicz, John E., 5,181,999, Cl. 204-180.100.
Aprica Kassai Kabushikikaisha: *See*—
Onishi, Ichiro, 5,181,735, Cl. 280-642.000.
Aquilera, Luis; Appalucci, Lawrence C.; and Mazoki, Gary, to Checkpoint Systems, Inc. Security tag with electrostatic protection. 5,182,544, Cl. 340-572.000.
Arai, Hideto; and Kobayashi, Seiji, to Sanshin Kogyo Kabushiki Kaisha. Cowling and air inlet device for outboard motor. 5,181,870, Cl. 440-77.000.
Arai, Junko: *See*—
Takata, Noboru; Arai, Junko; and Yorozu, Hidenori, 5,182,105, Cl. 424-78.020.
Arai, Kenji: *See*—
Sekiguchi, Akira; Nakajima, Masao; Kurihara, Kazumasa; and Arai, Kenji, 5,182,755, Cl. 371-16.300.
Arai, Koji: *See*—
Yoshioka, Kiyoharu; and Arai, Koji, 5,182,637, Cl. 358-75.000.
Arai, Shinichi: *See*—
Mizokami, Takuya; and Arai, Shinichi, 5,182,740, Cl. 369-47.000.
Arai, Takao: *See*—
Hatanaka, Yuuji; Okamoto, Hiroo; Arai, Takao; Wakumura, Shinichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 5,182,678, Cl. 360-32.000.
Arakawa, Junichi: *See*—
Horigome, Hideo; and Arakawa, Junichi, 5,182,583, Cl. 346-140.00R.
Araki, Yasuhiro: *See*—
Yoshioka, Osami; Matsui, Naoki; Sato, Hiroaki; Omori, Kouji; Yamazaki, Masayuki; Suzuki, Masafumi; Oishi, Hitoshi; Kitagawa, Naoto; Seike, Takaya; and Araki, Yasuhiro, 5,182,074, Cl. 266-87.000.
Arashima, Teruo: *See*—
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.
Aratani, Fukuo: *See*—
Yuge, Noriyoshi; Baba, Hiroyuki; and Aratani, Fukuo, 5,182,091, Cl. 423-348.000.
Arbisi, Thomas E.; Dykstra, Ronald A.; and Stannis, Gordon J., to Prince Corporation. Pivot down articulated mirror. 5,182,675, Cl. 359-841.000.
Archive Corporation: *See*—
Campbell, Kenneth C.; Gray, Roger M.; and Kockler, Barry C., 5,182,687, Cl. 360-92.000.
Arduengo, Anthony J., III, to Du Pont de Nemours, E. I., and Company. Preparation of 1,3-disubstituted imidazolium salts. 5,182,405, Cl. 548-335.100.
Ardueser, William A.: *See*—
Anstey, Henry D.; Ardueser, William A.; and Rumph, George W., 5,181,368, Cl. 53-587.000.
Argyle, Charles S.; Cheadle, Brian E.; and Bokor, Steven L. M., to Long Manufacturing Limited. Coolant corrosiveness indicator. 5,181,536, Cl. 137-559.000.
Arimoto, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Method for diffusing an n type impurity from a solid phase source into a III-V compound semiconductor. 5,182,229, Cl. 437-162.000.
Arisaki, Kenji; and Morimoto, Hisashi, to Babcock-Hitachi Kabushiki Kaisha. Pyrolysis furnace for olefin production. 5,181,990, Cl. 196-110.000.
Arizona Carbon Foil Company, Inc., The: *See*—
Stoner, Robert B., 5,182,585, Cl. 351-41.000.
Arkens, Charles T., to Rohm and Haas Company. Fiber binder. 5,182,179, Cl. 429-254.000.
Armiento, Craig A.: *See*—
Tabasky, Marvin; Cataldo, Victor; Fitzgerald, Thomas W.; Chirravuri, Jagannath; Armiento, Craig A.; and Haugsjaa, Paul O., 5,182,782, Cl. 385-89.000.
Artagraph Reproduction Technology Incorporated: *See*—
Lang, Stefan; and Kalef, Harvey, 5,182,063, Cl. 264-132.000.
Arthur, W. Eugene. Anti-glare shield system for highway median barriers. 5,181,695, Cl. 256-13.100.
Arzoumanidis, Gregory G.; and Peaches, Christine, to Amoco Corporation. Olefin polymerization and copolymerization catalyst. 5,182,245, Cl. 502-115.000.
Asahi Denka Kogyo Kabushiki Kaisha: *See*—
Akutsu, Mitsuo; and Iwakura, Syuji, 5,181,988, Cl. 162-135.000.
Edo, Hiroshi; Bannai, Takashige; Hayashi, Toshihiro; and Sugie, Masayuki, 5,182,123, Cl. 426-19.000.
Asahi Glass Co., Ltd.: *See*—
Shia, Yoshiaki; Mori, Hideaki; Kida, Otojiro; and Taketsugu, Hiroshi, 5,181,779, Cl. 374-139.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kawasaki, Masahiro; Takahashi, Hiroyuki; and Iwamoto, Shigeru, 5,182,591, Cl. 354-195.100.
Asahi, Masaki; and Noro, Yukio, to Mitsubishi Kasei Vinyl Company. Process for producing vinyl chloride resin of improved dispersibility by dehydration of latex. 5,182,362, Cl. 528-486.000.
Asahi Seiko Kabushiki Kaisha: *See*—
Abe, Hiroshi, 5,181,881, Cl. 453-57.000.
Asahi Yukizai Kogyo Co., Ltd.: *See*—
Yokoyama, Ikuo, 5,181,539, Cl. 137-625.320.
Asai, Jun, to Canon Kabushiki Kaisha. Transfer roller with voltage polarity control. 5,182,604, Cl. 355-273.000.
Asaka, Tatsuya: *See*—
Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, 5,182,757, Cl. 372-45.000.
Asami, Kouji: *See*—
Mishima, Ken; Mimura, Akio; Takahara, Yoshimasa; Asami, Kouji; and Hanai, Tetsuya, 5,182,193, Cl. 435-29.000.
Asea Brown Boveri Ltd.: *See*—
Svoboda, Vaclav, 5,181,559, Cl. 165-134.100.
Asfour, Yousif R., to Digital Equipment Corporation. Apparatus and method for providing fast data transfer between multiple devices through dynamic reconfiguration of the memory space of the devices. 5,182,801, Cl. 395-425.000.
Ashida, Shinichiro: *See*—
Shirasaki, Yasufumi; and Ashida, Shinichiro, 5,182,276, Cl. 514-224.200.
Ashida, Tatsuya: *See*—
Tsuji, Toshinori; Hosoya, Koichi; Tsukimoto, Fumio; Ashida, Tatsuya; Okubo, Katsuyuki; Bokuhara, Tetsuo; and Shinzo, Toshiaki, 5,181,668, Cl. 242-54.00R.
Ashida, Tetsuya: *See*—
Noda, Touru; Tsubaki, Masayuki; Sakai, Yasunosuke; Ashida, Tetsuya; and Matsuda, Hiroshi, 5,182,161, Cl. 428-195.000.
Ashikawa, Noboru; Yaguchi, Bunsho; Yasuda, Toyoshi; Takano, Masami; Ohhashi, Akihito; Shimada, Hiroyuki; and Akioka, Masahiro, to Honda Giken Kogyo Kabushiki Kaisha. Transmission for vehicle. 5,181,893, Cl. 475-203.000.
ASI Systems International: *See*—
Burnette, James E., 5,182,419, Cl. 102-523.000.
Askew, James D.; Chao, Chin-Wang; Cochran, David R.; Dollard, Peter M.; Eslambolchi, Hossein; Goodson, William E.; Guenther, Robert P.; Mansour, Omar M.; Nguyen, Liem T.; and Tanuku, Sarma S., to AT&T Bell Laboratories. Telecommunications network restoration architecture. 5,182,744, Cl. 370-16.000.
Askew, Warren E.; and Eddison, Alan, to Anadrill, Inc. Downhole adjustable stabilizer. 5,181,576, Cl. 175-61.000.
Asmo Co., Ltd.: *See*—
Sato, Toshihiro; Kiyama, Masaaki; Harita, Yasuhiro; and Ozone, Osamu, 5,181,838, Cl. 417-360.000.
Aso, Koichi: *See*—
Katori, Kenji; Hayakawa, Masatoshi; Aso, Koichi; Hayashi, Kazuhiko; and Kajiwara, Kazuo, 5,182,690, Cl. 360-120.000.
Asoh, Toshiaki; and Hosomi, Tatsuhide, to Mitsubishi Gas Chemical Co., Inc. Process for producing powder aggregate particle of high molecular weight polycarbonate resin. 5,182,363, Cl. 528-499.000.
Asteljoki, Jussi A.; Laulumaa, Jukka F.; and Lilja, Launo L., to Outokumpu Research Oy. Method and apparatus for heating and smelting pulverous solids and for volatilizing the volatile ingredients thereof in a suspension smelting furnace. 5,181,955, Cl. 75-443.000.
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Bales, Bruce M.; Crumpley, Robert L.; North, Sandra S.; and Thieler, Stephen M., 5,182,750, Cl. 370-110.100.
Bales, Bruce M.; Crumpley, Robert L.; North, Sandra S.; and Thieler, Stephen M., 5,182,751, Cl. 370-110.100.
Blonder, Greg E.; Cappuzzo, Mark A.; Clark, Harold R.; Scotti, Ronald E.; and Wong, Yiu-Huen, 5,182,787, Cl. 385-131.000.
Boylan, Jeffrey J.; and Pitzele, Lennart D., 5,182,536, Cl. 336-65.000.
Garland, Stuart M., 5,182,766, Cl. 379-216.000.
Atarashi, Junko: *See*—
Yamamoto, Naoki; Mukai, Nobuhiro; Ige, Hitoshi; and Atarashi, Junko, 5,182,332, Cl. 525-305.000.
Atlantic Richfield Company: *See*—
Montgomery, Melvin G., 5,182,760, Cl. 375-52.000.
Villa, Cindy S.; and Villa, Johnny, Jr., 5,181,833, Cl. 417-234.000.
Atochem: *See*—
Commandeur, Raymond; Drivon, Gilles; and Ghenassia, Elie, 5,181,992, Cl. 203-29.000.
Aufdemorte, Thomas B.: *See*—
Lew, Chel W.; Aufdemorte, Thomas B.; McGuff, Howard S.; and Alderson, Gerald L., 5,181,505, Cl. 128-200.260.
August, Melvin C.: *See*—
Steitz, Richard R.; Christie, Diane M.; Neumann, Eugene F.; August, Melvin C.; and Nelson, Stephen, 5,182,420, Cl. 174-52.400.
Ausman, Thomas G.; Longman, Douglas E.; and Stockner, Alan R., to Caterpillar, Inc. Hydraulically-actuated electronically-controlled unit injector having stroke-controlled piston and methods of operation. 5,181,494, Cl. 123-446.000.
Austry, Jerome M.: *See*—
Stites, John T., III; and Austry, Jerome M., 5,181,720, Cl. 273-80.200.

Autocam Corporation: *See*—
Hekman, Edward W.; and Hekman, Frederick A., 5,181,843, Cl. 418-1.000.

Automatik Apparate-Maschinenbau GmbH: *See*—
Nogossek, Alfred; and Keilert, Jurgen, 5,182,115, Cl. 425-71.000.

Automotive Products plc: *See*—
Nash, Ian A., 5,181,594, Cl. 192-70.270.

Avon Plastics, Inc.: *See*—
Reum, Donald J., 5,181,750, Cl. 285-38.000.

Ayers, Richard C.; and Wilson, Thomas G., to Lansing Overhaul And Repair, Inc. Stiffener for use with a heat exchanger. 5,181,561, Cl. 165-162.000.

B.A. Bodenheimer & Co., Inc.: *See*—
Bodenheimer, Bert A., 5,181,541, Cl. 137-899.000.

Baba, Hiroyuki: *See*—
Yuge, Noriyoshi; Baba, Hiroyuki; and Aratani, Fukuo, 5,182,091, Cl. 423-348.000.

Baba, Seigo: *See*—
Uehara, Shinichi; Satou, Kouichi; and Baba, Seigo, 5,182,122, Cl. 425-526.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Arisaki, Kenji; and Morimoto, Hisashi, 5,181,990, Cl. 196-110.000.

Babu, K. C.: *See*—
Matz, Bret A.; Babu, K. C.; and Kumar, Hemant, K. R., 5,181,858, Cl. 439-188.000.

Badstuebner, Hella: *See*—
Tietze, Walter; and Badstuebner, Hella, 5,181,595, Cl. 198-335.000.

Bagchi, Pranab; and Sargeant, Steven J., to Eastman Kodak Company. Increased photographic activity precipitated coupler dispersions prepared by coprecipitation with liquid carboxylic acids. 5,182,189, Cl. 430-449.000.

Bagg, Greville E., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Electrochemical generation of dinitrogen pentoxide in nitric acid. 5,181,996, Cl. 204-101.000.

Bagnoli, Carlo; Perrella, Guido; and Majo, Tommaso, to Honeywell Bull Italia S.p.A. Multiprocessor systems having distributed shared resources and deadlock prevention. 5,182,808, Cl. 395-725.000.

Bagrodia, Shriram; Fagerburg, David R.; Watkins, Joseph J.; and Lawrence, Paul B., to Eastman Kodak Company. Blends of copoly-(arylene sulfide) and polcarbonate. 5,182,345, Cl. 525-462.000.

Bahl, Lalit R.; Picheny, Michael A.; Nahamoo, David; and de Souza, Peter V., to International Business Machines Corporation. Speaker-independent label coding apparatus. 5,182,773, Cl. 381-41.000.

Bajorek, Jay E.; Cox, Austin E.; Kovack, Eugene S.; Lionetti, Michael S.; and Smisko, Joe, to Concept Five, Inc. Remote controlled theft deterrent system. 5,182,541, Cl. 340-428.000.

Bakanowsky, Louis J., III, to Curtis Manufacturing Company, Inc. Method of cleaning electrical contacts for computer and video games. 5,181,965, Cl. 134-8.000.

Baker, Franklin W. Motor vehicle brake pedal locking device. 5,181,404, Cl. 70-203.000.

Baker, James C.: *See*—
Kazecki, Henry L.; and Baker, James C., 5,182,749, Cl. 370-100.100.

Baker, Peter: *See*—
Thomas, Vincent P.; and Baker, Peter, 5,182,684, Cl. 360-78.090.

Balderrama, Mark A.; and Grogan, R. P., to Calmar Inc. Liquid pump dispenser having a stationary spout. 5,181,635, Cl. 222-383.000.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Metal treatment. 5,182,078, Cl. 419-9.000.

Bales, Bruce M.; Crumpley, Robert L.; North, Sandra S.; and Thieler, Stephen M., to AT&T Bell Laboratories. Transparent remoting of switching network control over a standard interface link. 5,182,750, Cl. 370-110.100.

Bales, Bruce M.; Crumpley, Robert L.; North, Sandra S.; and Thieler, Stephen M., to AT&T Bell Laboratories. Switching system using identical switching nodes. 5,182,751, Cl. 370-110.100.

Balk, Gary W.: *See*—
Andersen, Eugene C.; and Balk, Gary W., 5,181,572, Cl. 172-6.000.

Banash, Mark A.: *See*—
Caldwell, J. Brian; Banash, Mark A.; Che, Tessie M.; Mininni, Robert M.; and Warden, Victor N., 5,182,236, Cl. 521-12.000.

Bando Chemical Industries, Inc.: *See*—
Takahashi, Mitsuhiko; Miyata, Hirofumi; Yuki, Shinya; Nonaka, Keizo; Nakano, Yoshihisa; Mitsuhashi, Hiroshi; Yamaguchi, Katsuya; and Yoshida, Yasuhiko, 5,181,888, Cl. 474-101.000.

Bando Kiko Co., Ltd.: *See*—
Bando, Yoshihiro, 5,181,489, Cl. 123-242.000.

Bando, Yoshihiro, to Bando Kiko Co., Ltd. Rotary engine. 5,181,489, Cl. 123-242.000.

Bandy, Thomas R.; Read, Donna A.; and Wallace, Edward S., to ProTechnics International, Inc. Raioactive tracing with particles. 5,182,051, Cl. 252-645.000.

Bannai, Takashige: *See*—
Edo, Hiroshi; Bannai, Takashige; Hayashi, Toshihiro; and Sugie, Masayuki, 5,182,123, Cl. 426-19.000.

Bansal, Harjinder S.: *See*—
Lewis, Terence; Bansal, Harjinder S.; Sundley, Raymond L.; Bartley, Michael R.; Hepworth, Walter; Gilman, David J.; Kay, Ian T.; and Collins, David J., 5,182,402, Cl. 548-204.000.

BanTec, Inc.: *See*—
Norman, Thomas J., Jr.; Ingram, James R., Jr.; and Lin, Joel Y., 5,181,788, Cl. 400-232.000.

Baran, Michael, to Eaton Corporation. Switching mechanism for appliance controller. 5,182,461, Cl. 307-41.000.

Bardai, Zaher: *See*—
Sokolich, Marko; and Bardai, Zaher, 5,181,874, Cl. 445-24.000.

Baret, Gilles; Chicherie, Jean-Pierre; and Paquet, Jean-Marc, to Alcatel Cit. Pumping apparatus for pumping a gas by means of an oil-sealed vane pump and application to helium leak detectors. 5,181,414, Cl. 73-40.700.

Barilla G.E.R. F.LLI - Societa Per Azioni: *See*—
Bastetti, Giuseppe; and Veronesi, Sergio, 5,182,129, Cl. 426-589.000.

Barker, Stephen F.; Ricchio, Samuel G.; Benton, Glenn A.; and Jackson, Delbert D., to Beckman Instruments, Inc. Sample wheel for chemistry analyzers. 5,182,083, Cl. 422-63.000.

Barley, James C.: *See*—
Gray, Lewis; Garbarino, Joseph L.; Micol, John S.; Crenshaw, Johnny W.; Iacono, Vincent M.; Barley, James C.; Hollen, Richard L.; and Graziani, Terry M., 5,181,308, Cl. 29-436.000.

Barneck, Michael R. Sidepocket mandrel apparatus and methods. 5,181,566, Cl. 166-117.500.

Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, to ITT Corporation. Computer system and method for work management. 5,182,705, Cl. 364-401.000.

Barrick, Michael D.: *See*—
D'Agostino, William L.; Barrick, Michael D.; and Williams, Glen R., 5,182,779, Cl. 385-13.000.

Barrois, Claus D.; and Dieterich, Philipp A., to Koenig & Bauer Aktiengesellschaft. Inking unit washing assembly. 5,181,470, Cl. 101-425.000.

Barthel, James R. Painted article support apparatus. 5,181,686, Cl. 248-346.000.

Bartlett, Philip L.; Bivens, Donald B.; Lunger, Brooks S.; and Yokozeki, Akimichi, to Du Pont de Nemours, E. I., and Company. Azeotropic and azeotrope-like compositions of 1,1,2,2-tetrafluoroethane. 5,182,040, Cl. 252-67.000.

Bartley, Michael R.: *See*—
Lewis, Terence; Bansal, Harjinder S.; Sundley, Raymond L.; Bartley, Michael R.; Hepworth, Walter; Gilman, David J.; Kay, Ian T.; and Collins, David J., 5,182,402, Cl. 548-204.000.

Bartling, James E.; Little, Wendell L.; and Deierling, Kevin E., to Dallas Semiconductor Corp. Isolation gates to permit selective power-downs within a closely-coupled multi-chip system. 5,182,810, Cl. 395-750.000.

Bartscher, Peter; Singbartl, Gunther; Petersen, Erwin; and Ulrich, Helmut, to WABCO Westinghouse Fahrzeugbremsen GmbH. Device for monitoring the pressure of a measurement chamber charged with the pressure of a vehicle tire. 5,181,418, Cl. 73-146.300.

BASF Aktiengesellschaft: *See*—
Derber, Bernd; Hansen, Guenter; Reichelt, Helmut; Vamvakaris, Christos; and Zeidler, Georg, 5,182,372, Cl. 534-857.000.
Horn, Peter; Heckmann, Walter; Ramsteiner, Falko; and Gerold, Friedrich, 5,182,354, Cl. 528-60.000.
Schwiegk, Stefan; Mathauer, Klemens; Wegner, Gerhard; Hoffmann, Bernd F. W.; and Vogel, Albrecht, 5,182,005, Cl. 204-435.000.
Siegel, Bernd; and Patsch, Manfred, 5,182,371, Cl. 534-612.000.
Voelker, Heinz; Alicke, Gerhard; Schuch, Horst; Weilbacher, Manfred; and Weber, Reinhold, 5,182,308, Cl. 521-79.000.

BASF Corporation: *See*—
Hodan, John A., 5,181,400, Cl. 68-200.000.
Hodan, John A., 5,181,401, Cl. 68-200.000.
Patterson, Jimmy L.; and Riley, Robert E., 5,182,311, Cl. 521-131.000.

Bassett, John D., to International Paper Company. Multiple barb pick. 5,181,444, Cl. 83-154.000.

Bastetti, Giuseppe; and Veronesi, Sergio, to Barilla G.E.R. F.LLI - Societa Per Azioni. Method of preparing a glutamate-free, spreadable meat-containing condiment. 5,182,129, Cl. 426-589.000.

Battelle Memorial Institute: *See*—
Burton, Frederick G.; Cataldo, Dominic A.; Cline, John F.; Skiens, W. Eugene; and Van Voris, Peter, 5,181,952, Cl. 504-347.000.

Battery Engineering, Inc.: *See*—
Schlaikjer, Carl R., 5,182,177, Cl. 429-48.000.

Battista, Natalie. Substitute for pierced earrings. 5,181,397, Cl. 63-12.000.

Bauer, Barney; Blackburn, Brian K.; and Gentry, Scott B., to TRW Vehicle Safety Systems Inc. Seat belt system with comfort control. 5,181,739, Cl. 280-807.000.

Bauer, Steven R.; Kudo, Akira; Melchers, Georg F.; and Sakaguchi, Nobuo, to Hoffmann-La Roche Inc. Nucleotide sequences which are selectively expressed in pre-B cells and probes therefor. 5,182,205, Cl. 435-240.200.

Bauer, Volker; Raehse, Wilfried; Koester, Klaus; and Jacobs, Jochen, to Henkel Kommanditgesellschaft auf Aktien. Process for granulating perborate monohydrate. 5,182,054, Cl. 264-15.000.

Bauerfeind GmbH & Co.: *See*—
Bauerfeind, Hans B., 5,181,906, Cl. 602-63.000.

Bauerfeind, Hans B., to Bauerfeind GmbH & Co. Shoulder-joint bandage. 5,181,906, Cl. 602-63.000.

Baumgarten, Peter; Egner-Walter, Bruno; Schmid, Eckhardt; and Scholl, Wolfgang. Wiper system with extendible wiper arm. 5,181,293, Cl. 15-250.210.

Bausch & Lomb Incorporated: *See*—
Tucker, John F., 5,182,172, Cl. 428-632.000.

Baxter International Inc.: *See*—
Kersten, Jean; and Delmotte, Yves A., 5,181,276, Cl. 2-161.00R.

Baxter, Richard V., Jr.: *See*—
Stich, Frederick A.; Baxter, Richard V., Jr.; Podewils, Herbert A.; and Layden, David L., 5,182,518, Cl. 324-511.000.

Bayer Aktiengesellschaft: *See*—
Giesecke, Henning; Wolf, Gerhard D.; Muller, Hanns P.; von Gizycki, Ulrich; and Wienkenhover, Martin, 5,182,135, Cl. 427-98.000.
Grohe, Klaus, 5,182,401, Cl. 546-287.000.
Lonhoff, Norbert; Schmidt, Ludwig; Block, Hans-Dieter; and Weber, Rainer, 5,181,994, Cl. 204-97.000.
Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hanssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,182,286, Cl. 514-256.000.
Vente, Paul; and Wolfgarten, Achim, 5,181,856, Cl. 439-125.000.
von Bonin, Wulf, 5,182,049, Cl. 252-378.00R.

Beauchesne, Linda: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Bechtel, Richard L.; Thomas, Mammen; and Hively, James W., to Tactical Fabs, Inc. High density multichip package with interconnect structure and heatsink. 5,182,632, Cl. 257-713.000.

Beck, David C.; and Gundlach, Philip M., Jr., to McNeil (Ohio) Corporation. Apparatus for controlling and monitoring a lubricating system. 5,182,720, Cl. 364-509.000.

Becker, Hilton. Cannula and method for liposuction. 5,181,907, Cl. 604-22.000.

Becker, Karl L.; and Beldevere, Francesco, to Seeger Industrial S.A.; and Inamex de Cerveza y Malta, S.A. de C.V. System for decanting material in tower-type malthouses. 5,181,454, Cl. 99-277.200.

Becker, Richard: *See*—
Braeunling, Hermann; Becker, Richard; and Bloechl, Georg, 5,182,348, Cl. 526-256.000.

Becker-Ross, Helmut: *See*—
Florek, Stefan; Guther, Reiner; and Becker-Ross, Helmut, 5,182,609, Cl. 356-328.000.

Becker, Thomas P.: *See*—
Braun, Robert D.; Crass, Matthew M.; Piehl, James R.; Schend, David J.; Wollert, Gary S.; Mueckl, Jerry W.; and Becker, Thomas P., 5,182,512, Cl. 324-175.000.

Becker, Willi: *See*—
Merkel, Gerd; Vogt, Wilfried; Glaunsinger, Georg; Stadler, Peter; Zander, Claus-Peter; Maass, Jurgen; Schmitt, Gernot; Necker, Thomas; and Becker, Willi, 5,181,469, Cl. 101-415.100.

Beckman Instruments, Inc.: *See*—
Barker, Stephen F.; Ricchio, Samuel G.; Benton, Glenn A.; and Jackson, Delbert D., 5,182,083, Cl. 422-63.000.

Becton, Dickinson and Company: *See*—
Monthony, James F.; Livingston, Dwight; Reuben, Jayakumar; and Tite, Robert C., 5,182,082, Cl. 422-57.000.

Bedel, Joseph A.: *See*—
Wysong, Douglas E.; and Bedel, Joseph A., 5,181,804, Cl. 406-67.000.

Beezley, Dale L., to United States of America, Navy. Noise attenuating circuit for mechanical relay including optical isolation. 5,182,456, Cl. 250-551.000.

Begun, Ralph M.; Bland, Patrick M.; and Milling, Philip E., to International Business Machines Corporation. Dual bus microcomputer system with programmable control of lock function. 5,182,809, Cl. 395-725.000.

Behagel, Frank P.; Poorter, Tiemen; and Nuijten, Petrus A. C. M., to U.S. Philips Corp. Gate circuit having increased voltage handling capability. 5,182,479, Cl. 307-571.000.

Behar, Alain, to Societe Francaise d'Aerosols et de Bonchage. Nozzle with incorporated valve. 5,181,658, Cl. 239-493.000.

BeiBwenger, Siegfried: *See*—
Fritsche, Wolf E.; Lubbehusen, Michael; Kukla, Reiner; and BeiBwenger, Siegfried, 5,182,001, Cl. 204-192.120.

Beiley, Mark J.: *See*—
Benson, Robert W.; Beiley, Mark J.; Sareshwala, Sohel A.; Croft, Steven T.; and Vaughn, Jack M., 5,181,752, Cl. 285-81.000.

Bekkers, Marinus F. L., to C.C.M. Beheer B.V. Device for cutting loose the rectum of a slaughtered animal carcass. 5,181,878, Cl. 452-109.000.

Beldevere, Francesco: *See*—
Becker, Karl L.; and Beldevere, Francesco, 5,181,454, Cl. 99-277.200.

Belgum, Jack H., to Sutter Instrument Company. Method and apparatus for forming micropipette of controlled configuration. 5,181,948, Cl. 65-105.000.

Bell, Craig J., to Smiths Industries Medical Systems Inc. Method and apparatus for lavaging with oxygenated irrigating fluid while suctioning. 5,181,908, Cl. 604-24.000.

Beller, Laurence S., to EG&G Idaho, Inc. Ultrasonic tomography for in-process measurements of temperature in a multi-phase medium. 5,181,778, Cl. 374-119.000.

Belski, Gary T.: *See*—
Pollack, Richard S.; Phelan, John R.; Ames, Ronald M.; Starkey, Gene R.; Brown, Robert W.; Belski, Gary T.; and Dunn, William F., 5,181,975, Cl. 152-152.100.

Beltran, Adrian M.; and Kreischer, Charles H., to General Electric Company. Advanced high-temperature brazing alloys. 5,182,080, Cl. 420-588.000.

Bencini, Durval; and Da Silva Praca, Mario S., to Metal Leve S.A. Industria E Comercio. Sleeve bearing. 5,181,785, Cl. 384-288.000.

Benfarmeo, Nicholas; and Nalesnik, Theodore E., to Texaco Inc. Dispersant - anti-oxidant additive and lubricating oil composition containing same. 5,182,041, Cl. 252-51.50A.

Bengtsson, Bengt-Goran , to Advanced Flow Control AFC Aktiebolag. Method and device for regulating the spraying of coating materials. 5,182,704, Cl. 364-148.000.

Benitez, Rafael C. Interlocking building blocks. 5,181,362, Cl. 52-594.000.

Bennato, Antonio, to Moda Solaris S.p.A. Sunglasses structure. 5,182,586, Cl. 351-47.000.

Bennett, Carol E.: *See*—
Mezrow, Craig K.; Hunter, Robert L.; and Bennett, Carol E., 5,182,106, Cl. 424-78.310.

Bennett, Phillip P.: *See*—
Antonio, Robert C.; Bennett, Phillip P.; and Andrews, Mark R., 5,182,633, Cl. 358-11.000.

Benoit, Marc; Brayer, Jean-Louis; Demoute, Jean-Pierre; Mourioux, Gilles; and Taliani, Laurent, to Roussel Uclaf. Insecticidal benzofuran derivatives. 5,182,295, Cl. 514-365.000.

Benson, Robert W.; Beiley, Mark J.; Sareshwala, Sohel A.; Croft, Steven T.; and Vaughn, Jack M., to Lokring Corporation. Pipe fitting with swage ring locking mechanism. 5,181,752, Cl. 285-81.000.

Benson, Ronald: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Benton, Glenn A.: *See*—
Barker, Stephen F.; Ricchio, Samuel G.; Benton, Glenn A.; and Jackson, Delbert D., 5,182,083, Cl. 422-63.000.

Berardi, Sebastiano. Amphibious vehicle with retractable wheels. 5,181,478, Cl. 114-270.000.

Berecz, Imre, to Du Pont de Nemours, E. I., and Company. Continuous forming of composites. 5,182,060, Cl. 264-70.000.

Berg, Dieter: *See*—
Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hanssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,182,286, Cl. 514-256.000.

Berg, Jan: *See*—
Kerkenaar, Antonius; Schmedding, Diederik J. M.; and Berg, Jan, 5,182,194, Cl. 435-130.000.

Berger, Christoph, to Puma Rudolf Dassler Sport. Shoe with flexible upper material provided with a closing device. 5,181,331, Cl. 36-50.100.

Bergman, Arieh; Freedy, Amos; and Vermesh, Michael. Suture ligating device for use with an endoscope. 5,181,919, Cl. 606-144.000.

Bergwerksverband GmbH: *See*—
Weber, Raymond; and Wunnenberg, Wolfgang, 5,181,633, Cl. 222-195.000.

Berk, Donald A.: *See*—
Stanwich, Lawrence J.; Berk, Kenneth J.; Berk, Fredrick M.; and Berk, Donald A., 5,181,755, Cl. 294-1.100.

Berk, Fredrick M.: *See*—
Stanwich, Lawrence J.; Berk, Kenneth J.; Berk, Fredrick M.; and Berk, Donald A., 5,181,755, Cl. 294-1.100.

Berk, Kenneth J.: *See*—
Stanwich, Lawrence J.; Berk, Kenneth J.; Berk, Fredrick M.; and Berk, Donald A., 5,181,755, Cl. 294-1.100.

Bernard, Alain. Electronic telephone device. 5,182,767, Cl. 379-355.000.

Bernauer, Otto, to Mannesmann Aktiengesellschaft. Chemisorptive metal alloy and method of using the same. 5,182,089, Cl. 423-219.000.

Berndt, Charles F.: *See*—
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Berrun-Castanon, Jorge D.; Guerra-Reyes, Maria T.; and Ruiz-Leal, Leopoldo I., to Hylsa S.A. de C.V. Method for coating iron-bearing particles to be processed in a direct reduction process. 5,181,954, Cl. 75-433.000.

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Winters, Suzanne; Solen, Kenneth A.; Sanders, Clifton G.; Mortensen, J. D.; and Berry, Gaylord, 5,182,317, Cl. 523-112.000.

Bertelli, Guido; Cicchetti, Osvaldo; Goberti, Paolo; and Locatelli, Renato, to HIMONT Incorporated. Piperazine cyanurate and polymer compositions comprising it. 5,182,321, Cl. 524-100.000.

Bertelsen, Bruce: *See*—
Theys, Ezra; Taylor, Russell G.; Bertelsen, Bruce; Oey, Albert; Hoyrup, John; and Knafelc, Frank, 5,181,456, Cl. 99-485.000.

Best Power Technology, Inc.: *See*—
Stich, Frederick A.; Baxter, Richard V., Jr.; Podewils, Herbert A.; and Layden, David L., 5,182,518, Cl. 324-511.000.

Betensky, Ellis I.; and Ruben, Paul L., to Eastman Kodak Company. Real image zoom viewfinder. 5,182,592, Cl. 354-221.000.

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Bettinardi, Marco: *See*—
Zona, Mauro; and Bettinardi, Marco, 5,181,591, Cl. 191-12.00R.

Betz Laboratories, Inc.: *See—*
Liao, Wen P.; Chen, Fu; and Vasconcellos, Stephen R., 5,182,331, Cl. 525-294.000.

Beumer, Anton H., to Revab B.V. Biomechanical body support with tilting leg rest tilting seat and tilting and lowering backrest. 5,181,762, Cl. 297-358.000.

Bey, Philippe: *See—*
Palfreyman, Michael G.; Bey, Philippe; and McDonald, Ian A., 5,182,297, Cl. 514-438.000.

Beyer, Donald R.; Miller, Matthew R.; and Martinovich, Krsman, to Motorola, Inc. Data transmission system receiver having phase-independent bandwidth control. 5,182,761, Cl. 375-119.000.

Bezin, Michel; and Raemdonck, Joris V., to Look S.A. Composite bicycle fork. 5,181,732, Cl. 280-279.000.

Biale, John, to Rohm and Haas Company. High-gloss latex paints and polymers for use therein. 5,182,327, Cl. 524-556.000.

Bible, Christopher T., to Caliber Medical Corporation. Device for detecting abnormal heart muscle electrical activity. 5,181,519, Cl. 128-704.000.

Bieber, David: *See—*
Carpenter, Lester E.; Schmitt, Wayne I.; Snell, Laurence; Bieber, David; Stucke, Donald W.; and Waltzer, Jeremy S., 5,181,590, Cl. 190-18.00A.

Bielas, Michael S.; and El-Wailly, Tamim F., to Honeywell Inc. Digital synthetic serrodyne for fiber optic gyroscope. 5,182,611, Cl. 356-350.000.

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Rontey, Daniel C.; Bigando, Donald; and Wolfeil, Frank, 5,182,417, Cl. 102-204.000.

Bigg, Dennis: *See—*
Duflos, Alain; Patoiseau, Jean-Francois; Bigg, Dennis; and Kiss, Robert, 5,182,273, Cl. 514-83.000.

Bikson, Benjamin; Macheras, James T.; and Nelson, Joyce K., to Union Carbide Industrial Gases Technology Corporation. Hollow fiber membranes. 5,181,940, Cl. 55-16.000.

Binns, Matthew M.; Boursnell, Michael E. G.; Campbell, Joan I. A.; and Tomley, Fiona M., to National Research Development Corporation. Fowlpox virus promoters. 5,182,210, Cl. 435-320.100.

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Rigbi, Meir; and Jackson, Craig M., 5,182,113, Cl. 424-537.000.

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Prager, Bernhard C.; Wessely, Karl; and Veit, Werner, 5,182,383, Cl. 540-225.000.

Biogen, Inc.: *See—*
Allet, Bernard; and Kawashima, Eric H., 5,182,196, Cl. 435-69.500.
Maraganore, John M.; and Jakubowski, Joseph A., 5,182,260, Cl. 514-12.000.

Birk, Jeffrey H.: *See—*
Condon, Michael E.; Karp, Gary M.; and Birk, Jeffrey H., 5,182,397, Cl. 546-15.000.

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Wikstrom, Jan A.; Birrittella, Mark S.; Kiefer, David; Smetana, Stephen B.; and Swanson, Vernon W., 5,182,473, Cl. 307-454.000.

Bishop, Jerry B.; Schwind, Francis A.; and Sawyer, David B., to Sigma Tek, Inc. Rotary vane pump with carbon/carbon vanes. 5,181,844, Cl. 418-152.000.

Bishop, Thomas R.; Thom, Richard A.; and Breveglieri, Frank L., to Pliant Plastics Corporation. Key cover. 5,181,605, Cl. 206-37.100.

Bitner, Robert J.: *See—*
Lashyro, Jeffrey A.; and Bitner, Robert J., 5,181,598, Cl. 198-377.000.

Bitonti, Alan J.: *See—*
Freedman, Jules; and Bitonti, Alan J., 5,182,387, Cl. 540-590.000.

Bitzer, Bernd, to Sipra Patententwicklungs-und Beteiligungsgesellschaft mbH. Thread feeding device. 5,181,666, Cl. 242-47.010.

Bivens, Donald B.: *See—*
Bartlett, Philip L.; Bivens, Donald B.; Lunger, Brooks S.; and Yokozeki, Akimichi, 5,182,040, Cl. 252-67.000.

Blackburn, Brian K.: *See—*
Bauer, Barney; Blackburn, Brian K.; and Gentry, Scott B., 5,181,739, Cl. 280-807.000.

Bladen, Donald H.: *See—*
Engel, Richard B.; Gallo, John B.; Bladen, Donald H.; and Engel, Virginia F., 5,181,399, Cl. 68-13.00R.

Blair, Blaise G., to Output Technology Corporation. Printer ribbon guide assembly. 5,181,789, Cl. 400-248.000.

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Blaser, Eric; and Zumbe, Albert, to Jacobs Suchard AG. Sugar compositions with molasses-containing fraction of cane sugar as a source of fluoride ion. 5,182,114, Cl. 424-673.000.

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Blazek, William S.; and Wheaton, Harold L., to PCC Airfoils, Inc. Method of making a turbine engine component. 5,181,550, Cl. 164-100.000.

Blinchikoff, Herman J.; and Schofield, Ann C., to Westinghouse Electric Corp. Enhanced performance mode S interrogator. 5,182,563, Cl. 342-32.000.

Block, Hans-Dieter: *See—*
Lonhoff, Norbert; Schmidt, Ludwig; Block, Hans-Dieter; and Weber, Rainer, 5,181,994, Cl. 204-97.000.

Bloechl, Georg: *See—*
Braeunling, Hermann; Becker, Richard; and Bloechl, Georg, 5,182,348, Cl. 526-256.000.

Blonder, Greg E.; Cappuzzo, Mark A.; Clark, Harold R.; Scotti, Ronald E.; and Wong, Yiu-Huen, to AT&T Bell Laboratories. Optical waveguide structure including reflective asymmetric cavity. 5,182,787, Cl. 385-131.000.

Bluhm, Terry L.: *See—*
Mayo, James D.; Duff, James M.; Bluhm, Terry L.; and Hsiao, Cheng K., 5,182,382, Cl. 540-141.000.

Blumenkanz, Mark S.; and Wang, Carl, to Escalon Ophthalmics, Inc. Method for indenting the ocular coats of an eye. 5,181,922, Cl. 606-202.000.

Blyth, Randolph C.; and Ucci, Pompelio A., to Monsanto Company. Stain resistant nylon carpets. 5,182,154, Cl. 428-96.000.

Board of Regents, The University of Texas System: *See—*
Marcus, Harris L.; Lakshminarayan, Udaykumar; and Bourell, David L., 5,182,170, Cl. 428-551.000.

Board of Trustees operating Michigan State University: *See—*
Siegel, Marvin; Donohue, William; and Francois, Michael J., 5,182,543, Cl. 340-531.000.

Bobst SA: *See—*
Borel, Edouard, 5,181,468, Cl. 101-216.000.
Schoch, Gregor, 5,181,330, Cl. 34-162.000.

BOC Group, Inc., The: *See—*
Hill, Russell J.; and Smith, P. A. Joel, 5,182,488, Cl. 313-446.000.
Jain, Ravi, 5,181,942, Cl. 55-31.000.

Bochumer Eisenhutte Heintzmann GmbH & Co. KG: *See—*
Heintzmannn, Peter; and Guse, Kuno, 5,181,766, Cl. 299-34.000.

Bodenheimer, Bert A., to B.A. Bodenheimer & Co., Inc. Multi-tank fuel storage system for refrigerated freight container electric generatore. 5,181,541, Cl. 137-899.000.

Bodovsky, Paul W., to Continental Conveyor & Equipment Co. High-temperature fabric filter media. 5,181,945, Cl. 55-290.000.

Boehringer Mannheim Corporation: *See—*
Bolesky, Richard; Smith, Todd S.; and Whitcraft, Charles E., Jr., 5,181,928, Cl. 623-23.000.

Boeing Company, The: *See—*
Burkett, Fred T.; Bronson, Jerome G.; and Heeren, Robert G., 5,182,564, Cl. 342-53.000.

Boeing Corporation, The: *See—*
Johnson, Allan H.; and Woodbridge, Donald A., 5,182,449, Cl. 250-227.140.

Boffardi, Bennett P.; and Sherbondy, Ann M., to Calgon Corporation. Monofluorophosphate for calcium carbonate scale control and iron and manganese stabilization. 5,182,028, Cl. 210-697.000.

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Fiene, Rudiger; and Mayerbock, Wilhelm, 5,181,698, Cl. 267-140.120.

Bokor, Steven L. M.: *See—*
Argyle, Charles S.; Cheadle, Brian E.; and Bokor, Steven L. M., 5,181,536, Cl. 137-559.000.

Bokuhara, Tetsuo: *See—*
Tsuji, Toshinori; Hosoya, Koichi; Tsukimoto, Fumio; Ashida, Tatsuya; Okubo, Katsuyuki; Bokuhara, Tetsuo; and Shinzo, Toshiaki, 5,181,668, Cl. 242-54.00R.

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Bolin, Michael J.: *See—*
Peleg, Eliezer; Bolin, Michael J.; Browder, George A. G., Jr.; and Price, Charles M., 5,181,278, Cl. 2-243.00R.

Bonnet, Jacqueline: *See—*
Lesieur, Daniel; Lespagnol, Charles; and Bonnet, Jacqueline, 5,182,278, Cl. 514-233.800.

Boogers, Michael P. J.: *See—*
Claesen, Christianus A.; Lohmeijer, Johannus H. G. M.; Boogers, Michael P. J.; Bussink, Jan; Savenije, Hermannus B.; Hoeks, Theodorus L.; and Gosens, Johannes C., 5,182,325, Cl. 524-404.000.

Borden, Inc.: *See—*
Gerber, Arthur H., 5,182,346, Cl. 525-503.000.
Gerber, Arthur H., 5,182,347, Cl. 525-508.000.

Borel, Edouard, to Bobst SA. Pretensioned jack for controlling the operating pressure between two rotary cylinders. 5,181,468, Cl. 101-216.000.

Borys, Tadeusz; Lee, Shueh-Mo; and Wakefield, Earlby E. J., to Co-Ex-Tec Industries. Bilaminate polymer coated metal strip and method for manufacture thereof. 5,182,141, Cl. 427-379.000.

Bosc, Dominique; Guilbert, Martine; and Toinen, Christian, to France Telecom. Process for manufacturing a monomode optical waveguide mede of a polymer and endowed with electrooptic properties, and such an optical waveguide. 5,182,783, Cl. 385-123.000.

Bose Corporation: *See—*
Paynting, Richard J., 5,182,552, Cl. 340-825.250.

Bosses, Mark D.; and Milstein, Yuri, to Home Care Industries, Inc. Crimped vacuum bag seal and method of making the same. 5,181,946, Cl. 55-381.000.

Boston, Russell E.: *See—*
Kapp, David C.; Boston, Russell E.; Carlblom, Leland H.; McKinley, Mildred L.; and Kozma, Jess A., 5,182,148, Cl. 428-34.600.

Boston University, Trustees of: *See—*
Maraganore, John M.; and Jakubowski, Joseph A., 5,182,260, Cl. 514-12.000.

Boston University Research Foundation: *See—*
Aebischer, Patrick; and Winn, Shelley R., 5,182,111, Cl. 424-424.000.

Bott, Richard R.: *See—*
Estell, David A.; Bott, Richard R.; Power, Scott D.; and Wells, James A., 5,182,204, Cl. 435-222.000.

Botz, Jakob; Hofmann, Georg; and Weber, Adam, to SWF Auto-Electric. Electric switch, especially for operating a windshield wiper and washer system of a motor vehicle. 5,182,422, Cl. 200-61.540.

Botz, Jakob; Hofmann, Georg; and Weber, Adam, to SWF Auto-Electric. Electric switch for operating a windshield wiper and washer system of a motor vehicle. 5,182,423, Cl. 200-61.540.

Boughton, Rutland S.: *See*—
Heaton, Keith P.; Hunt, Kenneth W.; and Boughton, Rutland S., 5,181,288, Cl. 5-607.000.

Bourell, David L.: *See*—
Marcus, Harris L.; Lakshminarayan, Udaykumar; and Bourell, David L., 5,182,170, Cl. 428-551.000.

Bourk, Terrance R., to Telex Communications, Inc. Noise cancellation headset. 5,182,774, Cl. 381-71.000.

Boursnell, Michael E. G.: *See*—
Binns, Matthew M.; Boursnell, Michael E. G.; Campbell, Joan I. A.; and Tomley, Fiona M., 5,182,210, Cl. 435-320.100.

Bousquet, Hubert; Ravet, Georges; and Rousset, Jacky, to Coatex S.A. Process for grinding calcium carbonate in aqueous media. 5,181,662, Cl. 241-16.000.

Boutaud, Frederic; and Chauvel, Gerard, to Texas Instruments Incorporated. Process and device for graphically drawing point by point a closed curve of the second order. 5,182,795, Cl. 395-142.000.

Bouverie, Alain P. C., to Moulinex (Societe Anonyme). Wall-mounted hair dryer. 5,181,328, Cl. 34-97.000.

Bowles Fluidics Corporation: *See*—
Stouffer, Ronald D.; and Srinath, Dharapuram, 5,181,660, Cl. 239-589.100.

Boylan, Jeffrey J.; and Pitzele, Lennart D., to AT&T Bell Laboratories. Surface mount current transformer structure. 5,182,536, Cl. 336-65.000.

Brabetz, Ludwig: *See*—
Ertel, Gernot; Brabetz, Ludwig; and Schwarz, Waldemar, 5,182,523, Cl. 324-663.000.

Bracco Industria Chimica S.p.A.: *See*—
Felder, Ernst; Fumagalli, Luciano; Uggeri, Fulvio; and Vittadini, Giorgio, 5,182,370, Cl. 534-16.000.

Bradford, Raymond A.: *See*—
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.

Bradshaw, Jerald S.: *See*—
Bruening, Ronald L.; Tarbet, Bryon J.; Bradshaw, Jerald S.; Izatt, Reed M.; and Krakowiak, Krzysztof E., 5,182,251, Cl. 502-401.000.

Braeunling, Hermann; Becker, Richard; and Bloechl, Georg, to Wacker-Chemie GmbH. Arylmethylols, their preparation and their use. 5,182,348, Cl. 526-256.000.

Brandes, Wilhelm: *See*—
Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hanssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,182,286, Cl. 514-256.000.

Brandhorst, Gerd; and Taeschner, Wolfgang, to THERA Patent GmbH & Co. KG Gesellschaft Fuer industrielle Schutzrechte. Granules syringe. 5,181,918, Cl. 606-92.000.

Braswell, Charles D.; Carley, Robert E.; and Warddrip, Riley L. High-volume duplicator system and method providing efficient tower and duplicator operation and facilitated unloading in the collated duplex mode. 5,182,607, Cl. 355-323.000.

Braun, Dieter; Huss, Rolf; and Lampprecht, Alfred, to Memminger-Iro GmbH. Lubricating device for supplying several lubricating points, in particular of a knitting machine, with lubricant, preferably oil, and method. 5,181,585, Cl. 184-7.400.

Braun, Robert D.; Crass, Matthew M.; Piehl, James R.; Schend, David J.; Wollert, Gary S.; Mueckl, Jerry W.; and Becker, Thomas P., to Snap-on Tools Corporation. Method and apparatus for determining relative contributions of individual cylinders of internal combustion engine using contact tachometer. 5,182,512, Cl. 324-175.000.

Brausfeld, Walter, to Mannesmann Akiengesellschaft. Valve assembly for pressure fluids. 5,181,692, Cl. 251-367.000.

Brayer, Jean-Louis: *See*—
Benoit, Marc; Brayer, Jean-Louis; Demoute, Jean-Pierre; Mouriroux, Gilles; and Taliani, Laurent, 5,182,295, Cl. 514-365.000.

Breckwoldt, Jorn; and Szablikowski, Klaus, to Wolff Walsrode Aktiengesellschaft. Dihydroxypropyl sulphoethyl celluloses, their preparation and their use. 5,182,380, Cl. 536-90.000.

Breen, Bernard P.; and Gabrielson, James E., to Consolidated Natural Gas Service Company, Inc. Apparatus and process for control of nitric oxide emissions from combustion devices using vortex rings and the like. 5,181,475, Cl. 110-345.000.

Breeuwer, Marcel; and De With, Peter H. N., to U.S. Philips Corporation. Apparatus for deriving a compatible low-definition interlaced television signal and other components for reconstructing the original signal from an interlaced high-definition television signal. 5,182,645, Cl. 358-141.000.

Breuker, Walter; Wagner, Hans; Moller, Eckhard; and Schleimer, Bernhard, to Bunkawerke Huls GmbH. Device and process for precipitating polymers. 5,181,987, Cl. 159-4.080.

Breveglieri, Frank L.: *See*—
Bishop, Thomas R.; Thom, Richard A.; and Breveglieri, Frank L., 5,181,605, Cl. 206-37.100.

Brickner, Steven J., to Upjohn Company, The. Substituted 3(5'indazolyl) oxazolidin-2-ones. 5,182,403, Cl. 548-231.000.

Bridgestone Corporation: *See*—
Iwafune, Seiichiro; Yamaguchi, Kojiro; Takiguchi, Eiji; and Iwata, Toshiro, 5,181,976, Cl. 152-209.00R.
Kumagai, Yuzo; and Nishimoto, Kichinosuke, 5,181,982, Cl. 156-415.000.

Briggs, Richard S., Jr.: *See*—
Abraham, Robert L.; Moore, Richard E.; Rich, William L.; Shackelford, Floyd W.; Tiller, John R., Jr.; and Briggs, Richard S., Jr., 5,182,804, Cl. 395-600.000.

Brigham and Women's Hospital: *See*—
Gullans, Steven R.; and Heilig, Charles W., 5,182,299, Cl. 514-460.000.

Brigham Young University: *See*—
Bruening, Ronald L.; Tarbet, Bryon J.; Bradshaw, Jerald S.; Izatt, Reed M.; and Krakowiak, Krzysztof E., 5,182,251, Cl. 502-401.000.

British Bio-Technology Limited: *See*—
Edwards, Richard M.; and Burke, Julian F., 5,182,376, Cl. 536-23.200.

British Gas plc: *See*—
Ward, Peter; and Glen, Stephen J., 5,182,516, Cl. 324-326.000.

Brix, Peter, to Schott Glaswerke. Borosilicate glass for electronic flash lamps. 5,182,237, Cl. 501-66.000.

Brizendine, J. David; and Hooke, John, to Gates Energy Products, Inc. Suppression of electrolyte leakage from the terminal of a lead-acid battery. 5,182,178, Cl. 429-160.000.

Brock, Andrew J.; Lin, Lifun; Menkin, Paul; and Polan, Ned W., to Olin Corporation. Surface topography optimization through control of chloride concentration in electroformed copper foil. 5,181,770, Cl. 205-77.000.

Brodefors, Lage; and Irstam, Lars. Flow control. 5,181,532, Cl. 137-14.000.

Bronson, Jerome G.: *See*—
Burkett, Fred T.; Bronson, Jerome G.; and Heeren, Robert G., 5,182,564, Cl. 342-53.000.

Browder, George A. G., Jr.: *See*—
Peleg, Eliezer; Bolin, Michael J.; Browder, George A. G., Jr.; and Price, Charles M., 5,181,278, Cl. 2-243.00R.

Brown, George E.: *See*—
Schwab, Edward C.; and Brown, George E., 5,182,127, Cl. 426-241.000.

Brown, Keith, to Hymatic Engineering Company Limited, The. Cryogenic cooling apparatus. 5,181,386, Cl. 62-51.200.

Brown, Robert W.: *See*—
Pollack, Richard S.; Phelan, John R.; Ames, Ronald M.; Starkey, Gene R.; Brown, Robert W.; Belski, Gary T.; and Dunn, William F., 5,181,975, Cl. 152-152.100.

Brown, Russell M. Golf practice device. 5,181,723, Cl. 273-186.500.

Brown, Stephen H.; and von Ballmoos, Roland, to Englehard Corporation. Process for preparing fluidized cracking catalysts from equilibrium fluidized cracking catalysts. 5,182,243, Cl. 502-79.000.

Brown, Terry L. Adjustable gravel shield for a towed boat. 5,181,734, Cl. 280-414.100.

Brown-Wensley, Katherine A.: *See*—
DeVoe, Robert J.; Brown-Wensley, Katherine A.; and Tiers, George V. D., 5,182,316, Cl. 522-99.000.

Browne, James E.: *See*—
Kuhlmann, Erven J.; Pascoe, James R.; Browne, James E.; and Martin, Kevin J., 5,182,247, Cl. 502-217.000.

Bruce, Jeffrey N.: *See*—
Klein, David C.; Korf, Horst W.; and Bruce, Jeffrey N., 5,182,215, Cl. 436-514.000.

Bruck, Martin: *See*—
Vaahs, Tilo; Peuckert, Marcellus; and Bruck, Martin, 5,182,411, Cl. 556-409.000.

Bruckelmyer, Mark. Mobile heating system. 5,181,655, Cl. 237-1.00R.

Bruening, Ronald L.; Tarbet, Bryon J.; Bradshaw, Jerald S.; Izatt, Reed M.; and Krakowiak, Krzysztof E., to Brigham Young University. Aminoalkylphosphonic acid containing ligands attached to solid supports for removal of metal ions. 5,182,251, Cl. 502-401.000.

Bruzzese, Tiberio; Signorini, Massimo; Fanciano, Carlo A.; and Termini, Roberta, to SPA Societa' Prodotti Antibiotici S.p.A. Pharmacologically active peptide derivatives and pharmaceutical preparations containing them. 5,182,265, Cl. 514-18.000.

Brydon, John W. E.: *See*—
Wertheim, David F. P.; Oozeer, Rowena C.; Dubowitz, Victor; Connell, John A.; and Brydon, John W. E., 5,181,520, Cl. 128-731.000.

Buchmann, Oscar A., to Allied-Signal Inc. Ice particle separator. 5,181,384, Cl. 62-12.000.

Buckshaw, Thomas M.; Erdelsky, Joseph J.; and Martin, David M., to Robertshaw Controls Company. Temperature operated switch construction, terminal block therefor and methods of making the same. 5,182,539, Cl. 337-310.000.

Budd, Kenton D., to Minnesota Mining and Manufacturing Co. Shaped and fired articles of $YBa_2Cu_3O_7$. 5,182,255, Cl. 505-1.000.

Buechel, Johann: *See*—
Gschwend, Hans; and Buechel, Johann, 5,181,495, Cl. 123-46.0SC.

Buehler AG: *See*—
Lehrmann, Falko, 5,181,617, Cl. 209-31.000.

Bui-Hai, Nhu, to Alcatel N.V. Antenna having a circularly symmetrical reflector. 5,182,569, Cl. 343-781.0CA.

Bunkawerke Huls GmbH: *See*—
Breuker, Walter; Wagner, Hans; Moller, Eckhard; and Schleimer, Bernhard, 5,181,987, Cl. 159-4.080.

Bunnell, William P. Scoliosis screening device. 5,181,525, Cl. 128-781.000.

Burdeska, Kurt, to Ciba-Geigy Corporation. Process for the preparation of 2-(2',4'-dihydroxyphenyl)-4,6-diaryl-s-triazines. 5,182,389, Cl. 544-219.000.

Burdick, Maureen: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Burg, Donald E. Cyclical variable aperture valve for air cushion vehicles. 5,181,580, Cl. 180-116.000.

Burke, Julian F.: *See*—
Edwards, Richard M.; and Burke, Julian F., 5,182,376, Cl. 536-23.200.

Burke, Robert R., to Siemens Energy & Automation, Inc. Dynamoelectric machine having improved ventilation. 5,182,482, Cl. 310-89.000.

Burkett, Doug; and Mercer, Gary L., to Henny Penny Corporation. Method and apparatus for operating a food oven. 5,182,439, Cl. 219-412.000.

Burkett, Fred T.; Bronson, Jerome G.; and Heeren, Robert G., to Boeing Company, The. Guidance apparatus with dual mode sensor. 5,182,564, Cl. 342-53.000.

Burn, Mark N. Baffleless tube and shell heat exchanger having fluted tubes. 5,181,560, Cl. 165-162.000.

Burnette, James E., to ASI Systems International. Saboted projectile. 5,182,419, Cl. 102-523.000.

Burres, Neal S.: *See*—
Gunawardana, Geewananda P.; McCarthy, Peter J.; and Burres, Neal S., 5,182,287, Cl. 514-260.000.

Burton, Frederick G.; Cataldo, Dominic A.; Cline, John F.; Skiens, W. Eugene; and Van Voris, Peter, to Battelle Memorial Institute. Root-growth-inhibiting sheet. 5,181,952, Cl. 504-347.000.

Burton, Ralph A.; and Burton, Ralph G. Wear-resistant composite structure of vitreous carbon containing convoluted fibers. 5,182,166, Cl. 428-368.000.

Burton, Ralph G.: *See*—
Burton, Ralph A.; and Burton, Ralph G., 5,182,166, Cl. 428-368.000.

Bushimata, Teisuke: *See*—
Ueno, Kiyoshi; and Bushimata, Teisuke, 5,181,433, Cl. 74-409.000.

Bussink, Jan: *See*—
Claesen, Christianus A.; Lohmeijer, Johannus H. G. M.; Boogers, Michael P. J.; Bussink, Jan; Savenije, Hermannus B.; Hoeks, Theodorus L.; and Gosens, Johannes C., 5,182,325, Cl. 524-404.000.

B.V. Optische Industrie "De Oude Delft": *See*—
de la Fonteijne, Marcel R., 5,182,485, Cl. 310-334.000.

Byron, Peter R.; and Dalby, Richard N., to Virginia Commonwealth University. Formulations for delivery of drugs by metered dose inhalers with reduced or no chlorofluorocarbon content. 5,182,097, Cl. 424-45.000.

C.C.M. Beheer B.V.: *See*—
Bekkers, Marinus F. L., 5,181,878, Cl. 452-109.000.

C. Uyemura & Co., Ltd.: *See*—
Hashimoto, Shigeo; and Sugiura, Yutaka, 5,182,131, Cl. 427-8.000.

Cacciatore, Patricia A.: *See*—
Haydu, Juan; Paneccasio, Vincent, Jr.; and Cacciatore, Patricia A., 5,182,006, Cl. 205-213.000.

Caldwell, J. Brian; Banash, Mark A.; Che, Tessie M.; Mininni, Robert M.; and Warden, Victor N., to Enichem S.p.A.; and Istituto Guido Donegani S.p.A. Gradient index glasses and sol-gel method for their preparation. 5,182,236, Cl. 521-12.000.

Calgon Corporation: *See*—
Boffardi, Bennett P.; and Sherbondy, Ann M., 5,182,028, Cl. 210-697.000.

Caliber Medical Corporation: *See*—
Bible, Christopher T., 5,181,519, Cl. 128-704.000.

California Processing Machinery: *See*—
Camezon, Raymond E.; and Silbermann, Klaus, 5,181,459, Cl. 99-546.000.

Callne, Lars E. Articulating paper holder. 5,181,849, Cl. 433-153.000.

Calmar Inc.: *See*—
Balderrama, Mark A.; and Grogan, R. P., 5,181,635, Cl. 222-383.000.

Cam Sales, Inc.: *See*—
Leach, Christopher B., deceased; and Kaines, John L., 5,181,363, Cl. 52-685.000.

Camacho, Salvador L., to Plasma Energy Corporation. Apparatus for surface treating metal billets. 5,182,073, Cl. 266-52.000.

Camacho, Salvador L.: *See*—
Circeo, Louis J., Jr.; and Camacho, Salvador L., 5,181,795, Cl. 405-128.000.
Circeo, Louis J., Jr.; and Camacho, Salvador L., 5,181,797, Cl. 405-131.000.

Camaion, Domenico: *See*—
Lepori, Agostino; and Camaion, Domenico, 5,181,958, Cl. 106-170.000.

Camezon, Raymond E.; and Silbermann, Klaus, to California Processing Machinery. Fruit indent removal device. 5,181,459, Cl. 99-546.000.

Camm, James O.; and Camm, Stephen J. Combination mixer dispenser. 5,181,629, Cl. 222-80.000.

Camm, Stephen J.: *See*—
Camm, James O.; and Camm, Stephen J., 5,181,629, Cl. 222-80.000.

Campau, Daniel N., to Flow-Rite Controls, Ltd. Electric multi-point positioner. 5,181,540, Cl. 137-625.460.

Campbell, Frank, Jr. Squeeze-on insulation for reheating furnace water cooled skid systems. 5,181,319, Cl. 29-890.053.

Campbell, Joan I. A.: *See*—
Binns, Matthew M.; Boursnell, Michael E. G.; Campbell, Joan I. A.; and Tomley, Fiona M., 5,182,210, Cl. 435-320.100.

Campbell, Kenneth C.; Gray, Roger M.; and Kockler, Barry C., to Archive Corporation. Method and apparatus for aligning cartridges with a cartridge insertion slot. 5,182,687, Cl. 360-92.000.

Campbell, Mark D., to NCR Corporation. Method and system for determining copy-on-write condition. 5,182,805, Cl. 395-650.000.

Campbell, Richard J.; Miller, George G.; and Venia, Steven P. Support and manipulation mechanism for leaf and debris collector. 5,181,294, Cl. 15-315.000.

Cann, Gordon L., to Celestech, Inc. Diamond deposition cell. 5,182,093, Cl. 423-446.000.

Canon Kabushiki Kaisha: *See*—
Asai, Jun, 5,182,604, Cl. 355-273.000.
Endo, Michiaki, 5,182,694, Cl. 361-229.000.
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.
Horigome, Hideo; and Arakawa, Junichi, 5,182,583, Cl. 346-140.00R.
Iizuka, Takashi; Watanabe, Yutaka; and Fukuda, Yasuaki, 5,182,763, Cl. 378-34.000.
Ikeda, Kazue; and Ujita, Toshihiko, 5,182,580, Cl. 346-140.00R.
Inoue, Naoshi; Yoshida, Shigeo; and Sugino, Toshio, 5,182,650, Cl. 358-296.000.
Ishinaga, Hiroyuki; Saito, Asao; and Mori, Toshihiro, 5,182,577, Cl. 346-140.00R.
Ishizaki, Akira; Suzuki, Kenji; Ohtaka, Keiji; and Suda, Yasuo, 5,182,658, Cl. 358-483.000.
Kaihara, Shoji; and Haraguchi, Shousuke, 5,182,590, Cl. 354-106.000.
Kashimura, Makoto; Nakagomi, Hiroshi; Karita, Seiichiro; Fukuda, Tsuguhiro; Kimura, Tetsuo; Hirano, Hirofumi; and Kurata, Mitsuru, 5,182,581, Cl. 346-140.00R.
Kato, Motoi; and Nagashima, Yoshitake, 5,182,575, Cl. 346-108.000.
Kishi, Fumio; Akaike, Masatake; Yamamoto, Keisuke; Motoi, Taiko; Kaneko, Norio; Iwatate, Fujio; Ohmi, Kazuaki; Kawasaki, Takehiko; and Shinjou, Atsuko, 5,182,253, Cl. 505-1.000.
Kitagishi, Nozomu; and Yamazaki, Shoichi, 5,182,671, Cl. 359-557.000.
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Mizusawa, Nobutoshi; Suda, Shigeyuki; Nose, Noriyuki; and Kariya, Takao, 5,182,615, Cl. 356-400.000.
Masuda, Shunichi; Shimizu, Katsuichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 5,182,597, Cl. 355-205.000.
Mihara, Tadashi, 5,182,662, Cl. 359-63.000.
Muraki, Masato, 5,182,455, Cl. 250-548.000.
Nakayama, Toshiki, 5,182,447, Cl. 250-208.100.
Notagashira, Hidefumi; and Akutsu, Tsuyoshi, 5,182,674, Cl. 359-694.000.
Ohkoda, Keiji; Kudo, Tomohiro; Shimizu, Satoshi; and Kawasaki, Keiichi, 5,181,715, Cl. 271-272.000.
Ohtsuka, Naoji, 5,181,971, Cl. 148-103.000.
Okamura, Shigeru, 5,182,582, Cl. 346-140.00R.
Sakaki, Mamoru; Nakatsugawa, Tomomi; and Sato, Hiroshi, 5,182,175, Cl. 428-537.500.
Shinbori, Kenichi; Maeda, Nasaya; and Sakaegi, Yuji, 5,182,546, Cl. 340-636.000.
Suda, Yasuo; Nagano, Akihiko; and Konishi, Kazuki, 5,182,443, Cl. 250-201.200.
Tamamura, Hideo, 5,182,589, Cl. 354-105.000.
Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, 5,182,549, Cl. 340-784.000.
Ueda, Noriyoshi; Takahashi, Yuji; and Kitahara, Makoto, 5,181,705, Cl. 271-3.000.
Yamamoto, Akira; Kimura, Shigeo; Kusaka, Kensaku; Maruta, Hidekazu; and Adachi, Hiroyuki, 5,182,606, Cl. 355-289.000.
Yanagisawa, Yoshihiro; Sakai, Kunihiro; Takamatsu, Osamu; Eguchi, Ken; Matsuda, Hiroshi; Kawade, Hisaaki; and Takeda, Toshihiko, 5,182,724, Cl. 365-151.000.
Yoneyama, Yoshito; Toge, Yoshiyuki; and Yuguchi, Naoki, 5,182,617, Cl. 356-440.000.
Yoshikawa, Kikuo, 5,182,738, Cl. 369-44.140.
Yoshioka, Kiyoharu; and Arai, Koji, 5,182,637, Cl. 358-75.000.

Cappuzzo, Mark A.: *See*—
Blonder, Greg E.; Cappuzzo, Mark A.; Clark, Harold R.; Scotti, Ronald E.; and Wong, Yiu-Huen, 5,182,787, Cl. 385-131.000.

Carborundum Company, The: *See*—
Gilbert, Ronald E.; and Mordue, George S., 5,181,828, Cl. 415-200.000.

Cardiopulmonics, Inc.: *See*—
Winters, Suzanne; Solen, Kenneth A.; Sanders, Clifton G.; Mortensen, J. D.; and Berry, Gaylord, 5,182,317, Cl. 523-112.000.

Cardis, Angeline B.: *See*—
Okorodudu, Abraham O. M.; and Cardis, Angeline B., 5,182,036, Cl. 252-47.500.
Carl Freudenberg, Firma: *See*—
Sausner, Andreas; and Spies, Karl H., 5,181,492, Cl. 123-337.000.
Carl-Zeiss-Stiftung: *See*—
Guttner, Arnold; Herrmann, Jobst; and Simon, Karl-H., 5,181,306, Cl. 29-413.000.
Carlblom, Leland H.: *See*—
Kapp, David C.; Boston, Russell E.; Carlblom, Leland H.; McKinley, Mildred L.; and Kozma, Jess A., 5,182,148, Cl. 428-34.600.
Carley, Robert E.: *See*—
Braswell, Charles D.; Carley, Robert E.; and Warddrip, Riley L., 5,182,607, Cl. 355-323.000.
Carlos, Joseph M.; Carstensen, Thomas A.; Hall, William J.; and Osiecki, Larry J., to United Technologies, Corp. Composite sphere for a motion base simulator. 5,182,150, Cl. 428-35.700.
Carpenter, Donald; and Kushen, Craig. Condenser assembly. 5,181,395, Cl. 62-506.000.
Carpenter, Lester E.; Schmitt, Wayne I.; Snell, Laurence; Bieber, David; Stucke, Donald W.; and Waltzer, Jeremy S., to American Tourister, Inc. Luggage frame with pull handle. 5,181,590, Cl. 190-18.00A.
Carr, Peter W.: *See*—
Funkenbusch, Eric F.; Carr, Peter W.; Hahggi, Douglas A.; and Weber, Thomas P., 5,182,016, Cl. 210-198.200.
Carraro SpA: *See*—
Fabris, Armando A., 5,181,885, Cl. 464-170.000.
Carruba, Samuel C., to CBS Engineering, Inc. Offshore support structure apparatus. 5,181,799, Cl. 405-195.100.
Carson, Scott. Method and apparatus for forming articles made of polyurethane. 5,182,313, Cl. 521-155.000.
Carstensen, Thomas A.: *See*—
Carlos, Joseph M.; Carstensen, Thomas A.; Hall, William J.; and Osiecki, Larry J., 5,182,150, Cl. 428-35.700.
Carswell, Robert: *See*—
Meyer, Louis W.; Vanderhider, J. Alan; and Carswell, Robert, 5,182,034, Cl. 252-32.500.
Carter, Anthony E.: *See*—
Wass, Donald J.; and Carter, Anthony E., 5,181,542, Cl. 138-44.000.
Carter, Jeffrey D.: *See*—
Schmidt, William G.; Lockwood, Dean H.; and Carter, Jeffrey D., 5,182,125, Cl. 426-68.000.
Casadonte, Robert B.: *See*—
Paliwoda, Joseph; Casadonte, Robert B.; and Reinke, Ronald R., 5,181,346, Cl. 51-327.000.
Casio Computer Co., Ltd.: *See*—
Sato, Takashi; and Sano, Teruo, 5,182,657, Cl. 358-465.000.
Casper, Jacques: *See*—
Donntag, Jean-Marie; and Casper, Jacques, 5,181,717, Cl. 273-58.0BA.
Cassella Aktiengesellschaft: *See*—
Engelhardt, Friedrich; and Ebert, Gerlinde, 5,182,312, Cl. 521-149.000.
Cataldo, Dominic A.: *See*—
Burton, Frederick G.; Cataldo, Dominic A.; Cline, John F.; Skiens, W. Eugene; and Van Voris, Peter, 5,181,952, Cl. 504-347.000.
Cataldo, Victor: *See*—
Tabasky, Marvin; Cataldo, Victor; Fitzgerald, Thomas W.; Chirravuri, Jagannath; Armiento, Craig A.; and Haugsjaa, Paul O., 5,182,782, Cl. 385-89.000.
Caterpillar, Inc.: *See*—
Ausman, Thomas G.; Longman, Douglas E.; and Stockner, Alan R., 5,181,494, Cl. 123-446.000.
Henderson, Daniel E.; and Allen, William E., 5,182,501, Cl. 318-443.000.
Kyrtsos, Christos T.; and Gudat, Adam J., 5,182,712, Cl. 364-424.070.
Thurman, Dan L.; Slane, Melvin B.; Berndt, Charles F.; and Olszewski, John A., 5,181,375, Cl. 51-287.000.
Catone, David L.: *See*—
Kintz, Donald P.; and Catone, David L., 5,182,048, Cl. 252-363.500.
Cavanaugh, Wayne B.; Paige, Lowell E.; and Ripka, Chester D. Manually operated refrigerant recovery apparatus. 5,181,390, Cl. 62-126.000.
CBS Engineering, Inc.: *See*—
Carruba, Samuel C., 5,181,799, Cl. 405-195.100.
Cedrone, Alfredo: *See*—
Savegh, Emile G.; Martinez, John E.; and Cedrone, Alfredo, 5,182,785, Cl. 385-128.000.
Celestech, Inc.: *See*—
Cann, Gordon L., 5,182,093, Cl. 423-446.000.
Ceramiques Techniques Desmarquest: *See*—
Prats, Christian; and Vivier, Pierre, 5,181,929, Cl. 623-23.000.
CertainTeed Corporation: *See*—
Hannah, Marcia G.; Mehrer, George W.; Noone, Michael J.; Stahl, Kermit E.; and Quaranta, Joseph, 5,181,361, Cl. 52-535.000.
Chadima, George E., Jr.; and Laser, Vadim, to Norand Corporation. Instant portable bar code reader. 5,182,441, Cl. 235-472.000.
Chakraborty, Amiya K.; Rohde, Jurgen; Klatt, Karl-Heinz; Wenzl, Helmut; and Konrad, Ralf, to Forschungszentrum Julich GmbH; and Gesellschaft fur Reaktorsicherheit. Arrangement with protective effectiveness against the deposition of low-melting greases of high viscosity which are carried along in steam at the removal and ignition of hydrogen in a gas mixture containing hydrogen, oxygen and steam. 5,181,845, Cl. 431-7.000.
Chamberland, Marc. Pincers for throwing and catching a flying disc. 5,181,500, Cl. 124-5.000.
Chamberlin, Edward R.: *See*—
Goekler, Lewis E.; and Chamberlin, Edward R., 5,182,545, Cl. 340-620.000.
Chan, Litko R.: *See*—
Krause, James N.; Tremaine, Brian P.; and Chan, Litko R., 5,182,685, Cl. 360-78.130.
Chana, Palvinder; and Clapson, John D., to Square Grip Limited. Shearhead reinforcement. 5,181,359, Cl. 52-253.000.
Chang, Chu. Impact absorber. 5,181,699, Cl. 267-221.000.
Chang, Joseph S.; and Tong, Yit C., to University of Melbourne, The. Time-multiplexed switched capacitor circuit having reduced capacitance. 5,182,521, Cl. 328-167.000.
Chang, Li: *See*—
Chen, Hsing; Koo, Horng-Show; Chang, Li; and Shieh, K. L., 5,181,528, Cl. 131-256.000.
Chang, Ui Y., to Samsung Electronics Co., Ltd. Safety apparatus in gas heating device. 5,181,846, Cl. 431-80.000.
Chang, Win-Chyi, to Eastman Kodak Company. High resolution charge-coupled device (CCD) camera system. 5,182,647, Cl. 358-213.110.
Chansavoir, Alain: *See*—
Joncour, Christian; Chansavoir, Alain; and Marande, Bruno, 5,181,344, Cl. 51-165.750.
Chao, Chin-Wang: *See*—
Askew, James D.; Chao, Chin-Wang; Cochran, David R.; Dollard, Peter M.; Eslambolchi, Hossein; Goodson, William E.; Guenther, Robert P.; Mansour, Omar M.; Nguyen, Liem T.; and Tanuku, Sarma S., 5,182,744, Cl. 370-16.000.
Chao, Tze, to Du Pont de Nemours, E. I., and Company. Method for purifving TiO_2 ore. 5,181,956, Cl. 75-743.000.
Chapp, James, Jr.: *See*—
Khalifa, Mustafa A.; and Chapp, James, Jr., 5,181,435, Cl. 74-492.000.
Chappell, Ian C.; Matusch, Peter W. G.; and Matusch, Dagobert R. Conveyor structure. 5,181,600, Cl. 198-812.000.
Chatelain, Pierre: *See*—
Gubin, Jean; Chatelain, Pierre; Descamps, Marcel; Nisato, Dino; Inion, Henri; Lucchetti, Jean; Mahaux, Jean-Marie; and Vallat, Jean-Noel, 5,182,291, Cl. 514-300.000.
Chatten, Victor H. Bird deterrent method and device. 5,181,338, Cl. 43-58.000.
Chauvel, Gerard: *See*—
Boutaud, Frederic; and Chauvel, Gerard, 5,182,795, Cl. 395-142.000.
Che, Tessie M.: *See*—
Caldwell, J. Brian; Banash, Mark A.; Che, Tessie M.; Mininni, Robert M.; and Warden, Victor N., 5,182,236, Cl. 521-12.000.
Cheadle, Brian E.: *See*—
Argyle, Charles S.; Cheadle, Brian E.; and Bokor, Steven L. M., 5,181,536, Cl. 137-559.000.
Cheatle, Lucy M.: *See*—
Nickolls, Peter; Lu, Richard M. T.; Collins, Kenneth A.; McCulloch, Roy M.; Cheatle, Lucy M.; and Cleland, Brian, 5,181,511, Cl. 128-419.0PG.
Checkpoint Systems, Inc.: *See*—
Aquilera, Luis; Appalucci, Lawrence C.; and Mazoki, Gary, 5,182,544, Cl. 340-572.000.
Chen, Ching-Ming; and Lee, Cheng-Fu. Flying disk and top. 5,181,876, Cl. 446-47.000.
Chen, Fon-Chiu M.: *See*—
Fan, Eugene; Chen, Fon-Chiu M.; Milner, Michael W.; and Rehg, Leslie J., 5,182,191, Cl. 435-7.900.
Chen, Fu: *See*—
Liao, Wen P.; Chen, Fu; and Vasconcellos, Stephen R., 5,182,331, Cl. 525-294.000.
Chen, Fusen E.; Dixit, Girish A.; and Miller, Robert O., to SGS-Thomson Microelectronics, Inc. Interconnect and resistor for integrated circuits. 5,182,627, Cl. 257-49.000.
Chen, Hsing; Koo, Horng-Show; Chang, Li; and Shieh, K. L., to Industrial Technology Research Institute. Apparatus for extinguishing a lighted cigarette. 5,181,528, Cl. 131-256.000.
Chen, Hsing-Yao, to Chunghwa Picture Tubes, Ltd. Electron beam shaping aperture in low voltage, field-free region of electron gun. 5,182,492, Cl. 315-14.000.
Chen, Paul, Sr.; Sullivan, Vincent; Dolce, Thomas; and Jaffe, Mike, to Hoechst Celanese Corp. Compatible LCP blends via direct esterification. 5,182,334, Cl. 525-397.000.
Chen, Tan-Jen, to Exxon Research and Engineering Company. Separation of hydrocarbon dewaxing and deasphalting solvents from dewaxed and/or deasphalted oil using interfacially polymerized membrane. 5,182,024, Cl. 210-654.000.
Chen, Thomas P.: *See*—
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.
Chen, Tonny, to E. Lead Electronic Co., Ltd. Tape cassette winder and rewinder. 5,182,688, Cl. 360-94.000.
Chern, Wen-Foo, to Micron Technology, Inc. Zero crossing-current ring oscillator for substrate charge pump. 5,182,529, Cl. 331-57.000.

Chesterfield, Michael P.; Koyfman, Ilya; and Hain, Matthew E., to United States Surgical Corporation. Spiroid braided suture. 5,181,923, Cl. 606-228.000.

Chevion, Dan S.; Karnin, Ehud D.; and Walach, Eugeniusz, to International Business Machines Corporation. Method for compressing and decompressing forms by means of very large symbol matching. 5,182,656, Cl. 358-452.000.

Chevron Research and Technology Company: *See*—
Miller, Stephen J.; and Mulaskey, Bernie F., 5,182,012, Cl. 208-137.000.
Shuler, Patrick J., 5,181,567, Cl. 166-279.000.

Chhabra, Navjot; and Sandhu, Gurtej S., to Micron Technology, Inc. Metal silicide texturizing technique. 5,182,232, Cl. 437-200.000.

Chi, Yi C. Hub of a bicycle. 5,181,437, Cl. 74-594.100.

Chiba Dies Co., Ltd.: *See*—
Ueno, Kiyoshi; and Bushimata, Teisuke, 5,181,433, Cl. 74-409.000.

Chicherie, Jean-Pierre: *See*—
Baret, Gilles; Chicherie, Jean-Pierre; and Paquet, Jean-Marc, 5,181,414, Cl. 73-40.700.

Chieh, Baldwin: *See*—
Munich, Randy; Ewing, David; Lo, Tsai; Sheldrick, Wayne; and Chieh, Baldwin, 5,182,771, Cl. 380-5.000.

Chikuma, Kiyofumi; and Takei, Kiyoshi, to Pioneer Electronic Corporation. High density optical disk and method of making. 5,182,669, Cl. 359-241.000.

Childers, Craig M.: *See*—
Allison, Joseph W.; Richter, Jan; Childers, Craig M.; Smalley, Dennis R.; Hull, Charles W.; and Jacobs, Paul F., 5,182,055, Cl. 264-22.000.

China Steel Corp., Ltd.: *See*—
Yeh, Tse-Huei; Tsai, Song-Jau; Lin, Chang-Tsun; Liao, Long-Gee; and Huang, Tsai-Sheng, 5,181,408, Cl. 72-11.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 5,182,277, Cl. 514-231.200.

Chiou, George C. Y., to Orbon Corporation. Systemic delivery of polypeptides through the eye. 5,182,258, Cl. 514-3.000.

Chiou, Minshon J., to Du Pont de Nemours, E. I., and Company. Process of making fibers of sulfonated poly(p-phenylene terephthalamide). 5,182,067, Cl. 264-184.000.

Chirravuri, Jagannath: *See*—
Tabasky, Marvin; Cataldo, Victor; Fitzgerald, Thomas W.; Chirravuri, Jagannath; Armiento, Craig A.; and Haugsjaa, Paul O., 5,182,782, Cl. 385-89.000.

Choshi, Masahiro: *See*—
Hirose, Ichiro; Handa, Tomohisa; Iwata, Noriyuki; and Choshi, Masahiro, 5,181,485, Cl. 123-90.170.

Chou, Kuo-Hua. Hair clip. 5,181,530, Cl. 132-279.000.

Chou, Rudy S. Blade for axial flow fan. 5,181,830, Cl. 416-223.00R.

Christie, Diane M.: *See*—
Steitz, Richard R.; Christie, Diane M.; Neumann, Eugene F.; August, Melvin C.; and Nelson, Stephen, 5,182,420, Cl. 174-52.400.

Christopher, Kent L.: *See*—
Spofford, Bryan T.; and Christopher, Kent L., 5,181,509, Cl. 128-207.140.

Chriswell, Colin D., to Iowa State University Research Foundation, Inc. Method and means for testing soil samples. 5,181,428, Cl. 73-863.120.

Chruniak, Stephen A. Portable food and beverage storage unit mounted adjacent an air ventilator. 5,181,555, Cl. 165-41.000.

Chu, Hsien-Kun; Cross, Robert P.; and Crossan, David I., to Loctite Corporation. Photocurable silicone gel composition, and method of making the same. 5,182,315, Cl. 522-37.000.

Chu, Pochen: *See*—
Dwyer, Francis G.; Chu, Pochen; and Cormier, William E., Jr., 5,182,090, Cl. 423-704.000.

Chu, Shaw-Chang; and Kirk, Kevin A., to Mobil Oil Corporation. Biaxially oriented polypropylene film. 5,182,168, Cl. 428-330.000.

Chubu Electric Power Co., Inc., The: *See*—
Matsui, Shigetomo; Uenishi, Masahiro; Iuchi, Sadao; Sugimoto, Kouji; Itoga, Kouyu; Harada, Tetsuzo; Michiba, Kouji; Onda, Katsuhiro; and Okumura, Takaaki, 5,182,775, Cl. 382-8.000.

Chugai Ro Company, Limited: *See*—
Yamamoto, Tadashi; Seno, Takao; and Shiota, Shuichiro, 5,182,002, Cl. 204-210.000.

Chung, In S.: *See*—
Kim, Jae W.; and Chung, In S., 5,182,224, Cl. 437-52.000.

Chunghwa Picture Tubes, Ltd.: *See*—
Chen, Hsing-Yao, 5,182,492, Cl. 315-14.000.

Church & Dwight Co., Inc.: *See*—
Vinci, Alfredo; and Cummings, Kenneth R., 5,182,126, Cl. 426-74.000.

Ciba-Geigy Corporation: *See*—
Burdeska, Kurt, 5,182,389, Cl. 544-219.000.
Reinert, Gerhard; and Fuso, Francesco, 5,181,935, Cl. 8-442.000.

Cicchetti, Osvaldo: *See*—
Bertelli, Guido; Cicchetti, Osvaldo; Goberti, Paolo; and Locatelli, Renato, 5,182,321, Cl. 524-100.000.

Cincinnati Milacron, Inc.: *See*—
Piotrowski, Tadeusz W., 5,181,304, Cl. 29-271.000.
Piotrowski, Tadeusz W., 5,181,898, Cl. 483-3.000.

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Ledbetter, Jeffrey A.; and Clark, Edward A., 5,182,368, Cl. 530-388.730.

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Lydtin, Hans; and Clasen, Rolf, 5,182,052, Cl. 264-1.200.

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Schea, Henry E., III; and Cleary, Kenneth M., Jr., 5,181,394, Cl. 62-371.000.

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Allen, Timothy R., 5,181,432, Cl. 74-395.000.

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Borys, Tadeusz; Lee, Shueh-Mo; and Wakefield, Earlby E. J., 5,182,141, Cl. 427-379.000.

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Kulan, Stephen, 5,181,345, Cl. 51-165.770.

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Hutchison, Wayne R.; Patterson, Jon M.; Hardesty, Terry D.; Teal, Richard D.; Hayes, Eugene G.; Coffey, Michael J.; and Moore, Earl T., 5,181,688, Cl. 248-680.000.
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Colvin, David S. Vehicle occupant restraint belt buckle including illumination. 5,181,773, Cl. 362-75.000.
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Commandeur, Raymond; Drivon, Gilles; and Ghenassia, Elie, to Atochem. Separation of isomers, e. g., phenethyl bromide from 1-phenyl-1-bromoethane. 5,181,992, Cl. 203-29.000.
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Hart, Milburn L., 5,181,962, Cl. 118-306.000.
Compaq Computer Corporation: *See*—
Ruch, Mark H., 5,181,708, Cl. 271-21.000.
Comparetti, Joseph. Semi-flush flapper valve. 5,181,282, Cl. 4-404.000.
Composite Materials Technology, Inc.: *See*—
Wong, James, 5,182,176, Cl. 428-930.000.
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Cunningham, Brian; and Hanou, Frank, 5,182,706, Cl. 364-406.000.
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Farrow, Robert I.; Johnson, Drey; and Gaude, Robert, 5,181,667, Cl. 242-56.00R.
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Bajorek, Jay E.; Cox, Austin E.; Kovack, Eugene S.; Lionetti, Michael S.; and Smisko, Joe, 5,182,541, Cl. 340-428.000.
Condon, Michael E.; Karp, Gary M.; and Birk, Jeffrey H., to American Cyanamid Company. Aryloxyspiroalkylindolinone herbicides. 5,182,397, Cl. 546-15.000.
Condorodis, John P.: *See*—
Leras, Nicholas J.; and Condorodis, John P., 5,181,725, Cl. 273-402.000.
Connell, John A.: *See*—
Wertheim, David F. P.; Oozeer, Rowena C.; Dubowitz, Victor; Connell, John A.; and Brydon, John W. E., 5,181,520, Cl. 128-731.000.
Connell, John W.; Hergenrother, Paul M.; and Wolf, Peter, to United States of America, National Aeronautics and Space Administration. Poly(1,2,4-triazole) via aromatic nucleophilic displacement. 5,182,356, Cl. 528-128.000.
Conoco Inc.: *See*—
Powers, Maston L., 5,181,537, Cl. 137-561.00A.
Consolidated Natural Gas Service Company, Inc.: *See*—
Breen, Bernard P.; and Gabrielson, James E., 5,181,475, Cl. 110-345.000.
Continental Conveyor & Equipment Co.: *See*—
Bodovsky, Paul W., 5,181,945, Cl. 55-290.000.
Conzelmann, Gerhard: *See*—
Fieldler, Gerhard; and Conzelmann, Gerhard, 5,182,531, Cl. 333-167.000.
Cook, Gerry; and Lusin, Gary. Pneumatic traction device with electrically controlled compressor and relief valve. 5,181,904, Cl. 602-32.000.
Cook, Gregory D., to Cook Manufacturing Corporation. Hydraulic pump. 5,181,835, Cl. 417-310.000.
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Cook, Gregory D., 5,181,835, Cl. 417-310.000.
Cook, Phillip M.; and Kashdan, David S., to Eastman Kodak Company. Acid-curable cellulose esters containing melamine pendent groups. 5,182,379, Cl. 536-63.000.
Cooke, Theodore M.: *See*—
Merritt, Alfred R.; Cooke, Theodore M.; Lin, An-Chung R.; and Whitfield, Richard G., 5,182,572, Cl. 346-1.100.
Cooper, Gary. Hunting scope for determining accurate trajectory of a weapon. 5,181,323, Cl. 33-245.000.
Cooper, Tommy G.; Smith, Ross E.; and Macha, Emil S., to Healthdyne, Inc. Apparatus for recording reagent test strip data by comparison to color lights on a reference panel. 5,182,707, Cl. 364-413.110.
Cope, Kenneth P.: *See*—
Rodondi, Andrew F.; Cope, Kenneth P.; Gladd, Joseph H.; and Savich, James R., 5,181,867, Cl. 439-854.000.
Corbin, Amos: *See*—
Van Allman, Don T.; and Corbin, Amos, 5,181,886, Cl. 470-40.000.
Cormier, William E., Jr.: *See*—
Dwyer, Francis G.; Chu, Pochen; and Cormier, William E., Jr., 5,182,090, Cl. 423-704.000.
Cosmo Oil Co., Ltd.: *See*—
Usui, Kazushi; Fujikawa, Takashi; and Ohki, Katsuyoshi, 5,182,250, Cl. 502-314.000.
Cosmo Research Institute: *See*—
Usui, Kazushi; Fujikawa, Takashi; and Ohki, Katsuyoshi, 5,182,250, Cl. 502-314.000.
Cosse, Irvy E., Jr. Gravel/fertilizer packet for potted plants. 5,181,951, Cl. 71-64.110.
Costerousse, Germain: *See*—
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 5,182,381, Cl. 540-4.000.
Cote, Kevin: *See*—
Sjogren, Christer A.; and Cote, Kevin, 5,181,820, Cl. 414-331.000.
Cote, Pierre L.; Maurion, Roger P.; Lipski, Christopher J.; and Pedersen, Steven K., to Zenon Environmental Inc. Cartridge of hybrid frameless arrays of hollow fiber membranes and module containing an assembly of cartridges. 5,182,019, Cl. 210-321.800.
Cothrell, Leroy E., to Ultimizer's Inc. Optimizing cutoff saw. 5,181,445, Cl. 83-155.000.
Cox, Austin E.: *See*—
Bajorek, Jay E.; Cox, Austin E.; Kovack, Eugene S.; Lionetti, Michael S.; and Smisko, Joe, 5,182,541, Cl. 340-428.000.
Crane, Peter: *See*—
Chapin, Robert E.; and Crane, Peter, 5,182,689, Cl. 360-103.000.
Crane Plastics Company: *See*—
DeWorth, Sam, 5,181,371, Cl. 56-17.400.
Crass, Matthew M.: *See*—
Braun, Robert D.; Crass, Matthew M.; Piehl, James R.; Schend, David J.; Wollert, Gary S.; Mueckl, Jerry W.; and Becker, Thomas P., 5,182,512, Cl. 324-175.000.
Cray Research, Inc.: *See*—
Steitz, Richard R.; Christie, Diane M.; Neumann, Eugene F.; August, Melvin C.; and Nelson, Stephen, 5,182,420, Cl. 174-52.400.
Wikstrom, Jan A.; Birrittella, Mark S.; Kiefer, David; Smetana, Stephen B.; and Swanson, Vernon W., 5,182,473, Cl. 307-454.000.
Creagh, Linda T.; and Spehrley, Charles W., Jr., to Spectra, Inc. Hot melt ink jet transparency. 5,182,571, Cl. 346-1.100.
Creasman, Edwin A.; Paul, Thomas R.; Weber, Kenneth E.; Navarrete, David R.; McCullough, Jimmy D.; and Soodjinda, Churchai T., to Optical Radiation Corporation. Process for forming intraocular lenses having haptics with high fracture toughness. 5,182,053, Cl. 264-1.400.
Credle, William S., Jr., to Coca-Cola Company, The. Beverage dispenser valve with controllable flow rate. 5,181,631, Cl. 222-129.200.
Crenshaw, Johnny W.: *See*—
Gray, Lewis; Garbarino, Joseph L.; Micol, John S.; Crenshaw, Johnny W.; Iacono, Vincent M.; Barley, James C.; Hollen, Richard L.; and Graziani, Terry M., 5,181,308, Cl. 29-436.000.
Crinos Industria Farmacobiologica SpA: *See*—
Gazzani, Giovanni, 5,182,269, Cl. 514-44.000.
Crippen, Thomas E.: *See*—
Dumbleton, John H.; Lin, Ruey Y.; Stark, Casper F.; and Crippen, Thomas E., 5,181,930, Cl. 623-23.000.
Crittenden, John C.; Notthakun, Sawang; Hand, David W.; and Perram, David L., to Michigan Technological University, Board of Control of. Regeneration of adsorbents using advanced oxidation. 5,182,030, Cl. 210-748.000.
Croft, Steven T.: *See*—
Benson, Robert W.; Beiley, Mark J.; Sareshwala, Sohel A.; Croft, Steven T.; and Vaughn, Jack M., 5,181,752, Cl. 285-81.000.
Cross, Robert P.: *See*—
Chu, Hsien-Kun; Cross, Robert P.; and Crossan, David I., 5,182,315, Cl. 522-37.000.
Crossan, David I.: *See*—
Chu, Hsien-Kun; Cross, Robert P.; and Crossan, David I., 5,182,315, Cl. 522-37.000.
Crown Bolt, Inc.: *See*—
Linden, Tom H.; Passaglia, Dick; and Taccolini, Ray, 5,181,623, Cl. 211-183.000.
Crown International, Inc.: *See*—
Stanley, Gerald R., 5,182,465, Cl. 307-115.000.
Crown Iron Works Company: *See*—
Anderson, George E., 5,181,817, Cl. 411-369.000.
Crumpley, Robert L.: *See*—
Bales, Bruce M.; Crumpley, Robert L.; North, Sandra S.; and Thieler, Stephen M., 5,182,750, Cl. 370-110.100.
Bales, Bruce M.; Crumpley, Robert L.; North, Sandra S.; and Thieler, Stephen M., 5,182,751, Cl. 370-110.100.
CSD, Inc.: *See*—
Ritts, Gary, 5,182,533, Cl. 335-306.000.
Cuberes-Altisent, Maria R.; Frigola-Constansa, Jordi; and Pares-Corominas, Juan, to Laboratorios Del Dr. Esteve, S. A. Derivatives of benzimidazole and their use as antihistamines. 5,182,280, Cl. 514-252.000.
Culp, Gordon W., to Rockwell International Corporation. Releasing linear actuator. 5,182,484, Cl. 310-328.000.
Cummings, Kenneth R.: *See*—
Vinci, Alfredo; and Cummings, Kenneth R., 5,182,126, Cl. 426-74.000.

Cundiff, Kevin B.: *See*—
Oakes, Roger K.; and Cundiff, Kevin B., 5,182,438, Cl. 219-386.000.

Cunningham, Brian; and Hanou, Frank, to Computer Entry Systems Corporation. Buffer station for document processing and balancing facilitation. 5,182,706, Cl. 364-406.000.

Curtis Manufacturing Company, Inc.: *See*—
Bakanowsky, Louis J., III, 5,181,965, Cl. 134-8.000.

Curtiss, Linda K.: *See*—
Dyer, Cheryl A.; Curtiss, Linda K.; and Smith, Richard, 5,182,364, Cl. 530-324.000.

Cuscurida, Michael: *See*—
Duranleau, Roger G.; Plishka, Martin J.; and Cuscurida, Michael, 5,182,025, Cl. 210-681.000.

Custom Metallizing Services, Inc.: *See*—
Wilder, Harold J., 5,182,567, Cl. 392-389.000.

Czernichow, Jean, to Institut Francais du Petrole, Total Compagnie Francaise des Petroles, Compagnie Generald de Geophysique, Service National Dit: Gaz de France, Societe Nationale Elf Aquitaine (Production). Well probe able to be uncoupled from a rigid coupling connecting it to the surface. 5,181,565, Cl. 166-66.000.

Dabolt, Sheila. Litter-box and litter dispensing hopper. 5,181,480, Cl. 119-165.000.

Daenen, Robert H. C. M.; Lillelund, Stig; Kato, Masao; Lonergan, Peter; and Picozza, Augusto A., to Dart Industries, Inc. Closure assembly for containers. 5,181,626, Cl. 220-282.000.

D'Agostino, William L.; Barrick, Michael D.; and Williams, Glen R., to LTV Aerospace and Defense Company. Device, system and process for detecting tensile loads on a rope having an optical fiber incorporated therein. 5,182,779, Cl. 385-13.000.

Dahlin, Jan E. A. S.; and Raith, Krister A., to Telefonaktiebolaget L M Ericsson. Method of transmitting signaling messages in a mobile radio communication system. 5,182,753, Cl. 371-43.000.

Daiichi Denshi Kogyo Kabushiki Kaisha: *See*—
Honma, Kazuhiro; Watanabe, Kunio; Morita, Takeshi; and Nanao, Shingo, 5,181,860, Cl. 439-321.000.

Daiichi Pharmaceutical Co., Ltd.: *See*—
Shirasaki, Yasufumi; and Ashida, Shinichiro, 5,182,276, Cl. 514-224.200.

Daiki Engineering Co., Ltd.: *See*—
Takagi, Kazo; Nakamura, Shigeoki; and Murayama, Chisei, 5,182,007, Cl. 204-147.000.

Daimler-Benz AG: *See*—
Thelen, Ulrich; and Hirth, Thomas, 5,182,517, Cl. 324-418.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Kawabata, Motonobu, 5,182,668, Cl. 359-218.000.

Dalby, Richard N.: *See*—
Byron, Peter R.; and Dalby, Richard N., 5,182,097, Cl. 424-45.000.

Dallas Semiconductor Corp.: *See*—
Bartling, James E.; Little, Wendell L.; and Deierling, Kevin E., 5,182,810, Cl. 395-750.000.

Dambach, Philip J.; Long, Jerry A.; and Sampson, Stephen A., to Molex Incorporated. Programmable input-output electrical connector. 5,181,852, Cl. 439-52.000.

Damle, Pradeep D.: *See*—
Murib, Jawad H.; and Damle, Pradeep D., 5,182,058, Cl. 264-54.000.

Damon, Gary. System for duplicating bowling ball finger and thumb holes. 5,181,325, Cl. 33-510.000.

Dana Corporation: *See*—
Flotow, Richard A.; and Lewis, J. Michael, 5,181,593, Cl. 192-30.00W.

Dangelo, Michael: *See*—
Segill, William; Segill, Mark E.; and Dangelo, Michael, 5,181,777, Cl. 362-405.000.

Danho, Waleed; Tilley, Jefferson W.; Triscari, Joseph; and Wagner, Rolf, to Hoffmann-La Roche Inc. Analogs of tyrosine sulfate or tyrosine phosphate containing peptides. 5,182,263, Cl. 514-16.000.

Daniel Industries, Inc.: *See*—
Wass, Donald J.; and Carter, Anthony E., 5,181,542, Cl. 138-44.000.

Dantec Ltd.: *See*—
Davis, Eric J., 5,182,147, Cl. 428-34.400.

Dantono, David F.; and LaTremouille, Darrell F. Tiller handle extension. 5,181,869, Cl. 440-53.000.

DAP, Inc.: *See*—
Linden, Gary L., 5,182,357, Cl. 528-137.000.

Da Re', Mario, to Fiat Auto SpA. Composite material for the moulding of fibre-reinforced unsaturated polyester resin. 5,182,335, Cl. 525-30.000.

Dart Industries, Inc.: *See*—
Daenen, Robert H. C. M.; Lillelund, Stig; Kato, Masao; Lonergan, Peter; and Picozza, Augusto A., 5,181,626, Cl. 220-282.000.

Da Silva, Edilberto A. Lighter-key-holder arrangement. 5,181,847, Cl. 431-253.000.

Da Silva Praca, Mario S.: *See*—
Bencini, Durval; and Da Silva Praca, Mario S., 5,181,785, Cl. 384-288.000.

Dassault Electronique: *See*—
Luciani, Pierre; Deves, Philippe; and Tallibert, Patrick, 5,182,717, Cl. 364-481.000.

Dataproducts Corporation: *See*—
Merritt, Alfred R.; Cooke, Theodore M.; Lin, An-Chung R.; and Whitfield, Richard G., 5,182,572, Cl. 346-1.100.

Daub, John P.; Lahm, George P.; and Marlin, Bradford S., to Du Pont de Nemours, E. I., and Company. Substituted semicarbazone arthropodicides. 5,182,303, Cl. 514-583.000.

Daub, Wolfgang: *See*—
Lange, Ulrich V.; Daub, Wolfgang; and Wendt, Friedrich-Karl, 5,182,432, Cl. 219-202.000.

Davenport, William H.: *See*—
Taylor, Stewart S.; McCormack, Gary D.; Davenport, William H.; and Hamilton, Patrick J., 5,182,467, Cl. 307-243.000.

Davis, Eric J., to Dantec Ltd. Composite hose. 5,182,147, Cl. 428-34.400.

Davis, John M.; Davis, Mark E.; and Jennings, David G., to Kegel Company, Inc. Bowling lane maintenance machine. 5,181,290, Cl. 15-98.000.

Davis, Mark A.: *See*—
Sunderland, Richard A.; Walker, Clarence L.; and Davis, Mark A., 5,181,842, Cl. 417-474.000.

Davis, Mark E.: *See*—
Davis, John M.; Davis, Mark E.; and Jennings, David G., 5,181,290, Cl. 15-98.000.

Davis, R. Andrew, to Omni Rubber Products, Inc. Composite rubber/-concrete railroad grade crossing system. 5,181,657, Cl. 238-8.000.

Davis, Verlon L. Apparatus and method for refurbishing a drive tumbler. 5,181,434, Cl. 74-447.000.

Davis, Wesley: *See*—
Gasperi, Michael L.; and Davis, Wesley, 5,182,794, Cl. 395-23.000.

Dawes, James W., to Du Pont de Nemours, E. I., and Company. Chlorinated ethylene copolymer latex. 5,182,322, Cl. 524-308.000.

de la Fonteijne, Marcel R., to B.V. Optische Industrie "De Oude Delft". Ultrasonic transducer comprising at least one row of ultrasonic elements. 5,182,485, Cl. 310-334.000.

DeCecca, Michael L.: *See*—
Kroll, Arthur S.; Dunn, Arthur E.; DeCecca, Michael L.; Gaudino, David M.; Livadas, Jerry E.; Fairport, David R.; and Rydelek, James G., 5,182,608, Cl. 355-326.000.

Deco-Grand, Inc.: *See*—
Paliwoda, Joseph; Casadonte, Robert B.; and Reinke, Ronald R., 5,181,346, Cl. 51-327.000.

Deere & Company: *See*—
Anstey, Henry D.; Ardueser, William A.; and Rumph, George W., 5,181,368, Cl. 53-587.000.
Hutchison, Wayne R.; Patterson, Jon M.; Hardesty, Terry D.; Teal, Richard D.; Hayes, Eugene G.; Coffey, Michael J.; and Moore, Earl T., 5,181,688, Cl. 248-680.000.
Viaud, Jean, 5,181,461, Cl. 100-88.000.

DeFiore, Hannah B. Catherer shower shield. 5,181,274, Cl. 2-46.000.

Degrauwe, Dirk M.; Raemdonck, Marcel A.; and Geleyns, Eduard A., to Agfa-Gevaert N. V. Curtain coater for photographic elements. 5,181,963, Cl. 118-325.000.

Deguchi, Toshihisa: *See*—
Maeda, Shigemi; Deguchi, Toshihisa; and Terashima, Shigeo, 5,182,741, Cl. 369-50.000.

Deierling, Kevin E.: *See*—
Bartling, James E.; Little, Wendell L.; and Deierling, Kevin E., 5,182,810, Cl. 395-750.000.

Deiuri, Adriano, to SOBREVIN Societe de brevets industriels-Etablissement. Delivery device with automatic threading system for weft storage drum. 5,181,544, Cl. 139-452.000.

Dekel, Joseph. Gutter drain apparatus. 5,181,793, Cl. 404-4.000.

Delaware Capital Formation, Inc.: *See*—
Evans, Alfred J., 5,181,302, Cl. 29-243.560.

Delbar Products, Inc.: *See*—
Kerper, Richard W., 5,181,687, Cl. 248-479.000.

Dellanno, Ronald P.; and Gualtier, Quentin E., to Dellanno, Ronald P. Apparatus for preventing whiplash. 5,181,763, Cl. 297-391.000.

Delmotte, Yves A.: *See*—
Kersten, Jean; and Delmotte, Yves A., 5,181,276, Cl. 2-161.00R.

DeMint, Paul: *See*—
Johnson, Drey; Gaude, Robert; Farrow, Robert I.; DeMint, Paul; and McNeill, Ray O., 5,181,669, Cl. 242-56.00R.

Demoute, Jean-Pierre: *See*—
Benoit, Marc; Brayer, Jean-Louis; Demoute, Jean-Pierre; Mouriroux, Gilles; and Taliani, Laurent, 5,182,295, Cl. 514-365.000.

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Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 5,182,381, Cl. 540-4.000.

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Bahl, Lalit R.; Picheny, Michael A.; Nahamoo, David; and de Souza, Peter V., 5,182,773, Cl. 381-41.000.
Deutsch, David. Solar water purification device. 5,181,991, Cl. 202-176.000.
Deutsche Automobilgesellschaft mbH: *See*—
Kistrup, Holger; and Imhof, Otwin, 5,182,241, Cl. 502-24.000.
Deutsche Forschungsanstalt fur Luft- und Raumfahrt: *See*—
Witte, Franz, 5,182,562, Cl. 342-25.000.
Deutsche ITT Industries GmbH: *See*—
Theus, Ulrich, 5,182,525, Cl. 330-253.000.
Devallez, Alain: *See*—
Petit, Jean-Michel; and Devallez, Alain, 5,181,473, Cl. 105-133.000.
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De Veirman, Geert A.: *See*—
Yamasaki, Richard G.; and De Veirman, Geert A., 5,182,477, Cl. 307-494.000.
Develop Dr. Eisbein GmbH & Co.: *See*—
Neugebauer, Alfred, 5,181,713, Cl. 271-160.000.
Deves, Philippe: *See*—
Luciani, Pierre; Deves, Philippe; and Tallibert, Patrick, 5,182,717, Cl. 364-481.000.
Devices for Vascular Intervention, Inc.: *See*—
Mueller, Richard L.; Farley, Brian E.; and Pfeiffer, James F., 5,181,920, Cl. 606-159.000.
Devine, John A., Jr. Vapor generator apparatus for powering a motor. 5,181,378, Cl. 60-39.550.
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De With, Peter H. N.: *See*—
Breeuwer, Marcel; and De With, Peter H. N., 5,182,645, Cl. 358-141.000.
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Diamond Communication Products, Inc.: *See*—
Coll, Gene, 5,181,680, Cl. 248-61.000.
Diaz, Simon: *See*—
Tobkes, Martin; Diaz, Simon; and Krishnan, Lalitha, 5,182,374, Cl. 536-16.500.
DiBiase, Stephen A.: *See*—
Pialet, Joseph W.; Scharf, Curtis R.; and DiBiase, Stephen A., 5,182,037, Cl. 252-47.500.
Dickie, Robert G.; and Phillips, Michael, to Paige Manufacturing Company Incorporated. Apparatus for plastic injection overmolding. 5,182,032, Cl. 249-91.000.
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Grosswiller, Leo J.; Theriault, F. Michael; Mannella, Lawrence F.; and Anders, Walter G., 5,181,805, Cl. 406-189.000.
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Diehl GmbH & Co.: *See*—
Rumer, Klaus, 5,181,697, Cl. 267-116.000.
Diesel Kiki Co., Ltd.: *See*—
Sekiguchi, Akira; Nakajima, Masao; Kurihara, Kazumasa; and Arai, Kenji, 5,182,755, Cl. 371-16.300.
Dieterich, Philipp A.: *See*—
Barrois, Claus D.; and Dieterich, Philipp A., 5,181,470, Cl. 101-425.000.
Dietz, David H., to Foster Wheeler Energy Corporation. Fluidized bed combustion system and method having multiple furnace sections. 5,181,481, Cl. 122-4.00D.
Digital Equipment Corporation: *See*—
Asfour, Yousif R., 5,182,801, Cl. 395-425.000.
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Director-General of Agency of Industrial Science and Technology: *See*—
Kasuga, Kazuyuki; Hirose, Takuji; Takahashi, Toshikazu; and Hiratani, Kazuhisa, 5,182,398, Cl. 346-171.000.
Displaytech, Inc.: *See*—
O'Callaghan, Michael J.; and Handschy, Mark A., 5,182,665, Cl. 359-95.000.
Divers, George A., III: *See*—
Hui, Henry K.; Divers, George A., III; and Soikowski, Carmen, 5,182,353, Cl. 528-31.000.
Dix, J. Kimberley: *See*—
Wheat, James A.; Fuoco, Rolland P.; and Dix, J. Kimberley, 5,182,163, Cl. 428-224.000.
Dixit, Girish A.: *See*—
Chen, Fusen E.; Dixit, Girish A.; and Miller, Robert O., 5,182,627, Cl. 257-49.000.
Dixit, Sunit S.: *See*—
Lazarus, Richard M.; Kautz, Randall; and Dixit, Sunit S., 5,182,184, Cl. 430-165.000.
Dixon, Richard A. F.: *See*—
Gillard, John W.; Gauthier, Jacques-Yves; Evans, Jillian F.; Fortin, Rejean; Guinon, Yvan; Dixon, Richard A. F.; and Miller, Douglas K., 5,182,367, Cl. 530-350.000.
Dlabac, Antonin: *See*—
Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , 5,182,285, Cl. 514-255.000.
Dmk Tek, Inc.: *See*—
Shapovalov, Vladimir I., 5,181,549, Cl. 164-79.000.
Dodds, John F.: *See*—
Stroud, James W., III; and Dodds, John F., 5,182,716, Cl. 364-476.000.
Doi, Koichi, to Nissan Motor Company, Limited. Air conditioner system for automotive vehicle with minimum discharge temperature for rear foot outlet. 5,181,553, Cl. 165-22.000.
Dolce, Thomas: *See*—
Chen, Paul, Sr.; Sullivan, Vincent; Dolce, Thomas; and Jaffe, Mike, 5,182,334, Cl. 525-397.000.
Dollard, Peter M.: *See*—
Askew, James D.; Chao, Chin-Wang; Cochran, David R.; Dollard, Peter M.; Eslambolchi, Hossein; Goodson, William E.; Guenther, Robert P.; Mansour, Omar M.; Nguyen, Liem T.; and Tanuku, Sarma S., 5,182,744, Cl. 370-16.000.
Donelon, John J.; Doyle, James P.; Hurst, Jerry E., Jr.; Oprysko, Modest M.; Rossnagel, Stephen M.; and von Gutfeld, Robert J., to International Business Machines Corporation. Laser methods for circuit repair on integrated circuits and substrates. 5,182,230, Cl. 437-173.000.
Donntag, Jean-Marie; and Casper, Jacques, to Adidas Sarragan France. Inflated sports ball. 5,181,717, Cl. 273-58.0BA.
Donohue, John M.: *See*—
Labbe, Donald E.; Line, Lawrence J.; Geary, Christopher T.; Leigh, Mark C.; and Donohue, John M., 5,181,482, Cl. 122-392.000.
Donohue, William: *See*—
Siegel, Marvin; Donohue, William; and Francois, Michael J., 5,182,543, Cl. 340-531.000.
Doolittle, Edson P., to General Motors Corporation. Collapsible arm rest. 5,181,759, Cl. 296-153.000.
Dorn Color, Inc.: *See*—
Roblin, William J., 5,181,704, Cl. 270-54.000.
Dornier Medizintechnik GmbH: *See*—
Viebach, Thomas; Kreibich, Rainer; Nuber, Bernd; Pauker, Robert; and Hesse, Alexander, 5,181,512, Cl. 128-660.030.
Dorr-Oliver Deutschland GmbH: *See*—
Coenen, Hubert, 5,182,406, Cl. 554-13.000.
Dorscht, John P.; and Hogan, Patrick J. Tub grinder with screen portion. 5,181,663, Cl. 241-81.000.
Dorsey, James C.; and Moore, Johnnie L. Prophylactic device. 5,181,527, Cl. 128-830.000.
Dow Chemical Company, The: *See*—
Hefner, Robert E., Jr.; and Earls, Jimmy D., 5,182,340, Cl. 525-525.000.
Meyer, Louis W.; Vanderhider, J. Alan; and Carswell, Robert, 5,182,034, Cl. 252-32.500.
Parker, Theodore L., 5,182,344, Cl. 525-438.000.
Pike, William C., 5,182,026, Cl. 210-688.000.
Skorpenske, Richard G.; and Schrock, Alan K., 5,182,310, Cl. 521-116.000.
Doxbeck, Mark: *See*—
Frankel, Julius; and Doxbeck, Mark, 5,182,139, Cl. 427-9.000.
Doyle, James P.: *See*—
Donelon, John J.; Doyle, James P.; Hurst, Jerry E., Jr.; Oprysko, Modest M.; Rossnagel, Stephen M.; and von Gutfeld, Robert J., 5,182,230, Cl. 437-173.000.
Dresser Industries, Inc.: *See*—
Leonard, Robert F.; and Styckiewicz, Carl J., 5,181,422, Cl. 73-715.000.
Drivon, Gilles: *See*—
Commandeur, Raymond; Drivon, Gilles; and Ghenassia, Elie, 5,181,992, Cl. 203-29.000.
DSM N.V.: *See*—
Geerlof, Arie; Groen, Barend; and Duine, Johannis A., 5,182,209, Cl. 435-280.000.
DuBois, Edward J. Escape proof fish hook connector. 5,181,337, Cl. 43-44.830.

Dubowitz, Victor: *See*—
Wertheim, David F. P.; Oozeer, Rowena C.; Dubowitz, Victor; Connell, John A.; and Brydon, John W. E., 5,181,520, Cl. 128-731.000.
Ducharme, Jean-Louis. Ventilating device for baseboard heater. 5,181,884, Cl. 454-246.000.
Duff, James M.: *See*—
Mayo, James D.; Duff, James M.; Bluhm, Terry L.; and Hsiao, Cheng K., 5,182,382, Cl. 540-141.000.
Duffy, Joan: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.
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Dufour, Denis; and Fortin, Francois, to Gaz de France. Process and connection component using an electrical resistor for the welding of plastic elements. 5,182,440, Cl. 219-535.000.
Duine, Johannis A.: *See*—
Geerlof, Arie; Groen, Barend; and Duine, Johannis A., 5,182,209, Cl. 435-280.000.
Duke University: *See*—
Vann, Richard D.; and Gerth, Wayne A., 5,181,903, Cl. 600-36.000.
Dumbleton, John H.; Lin, Ruey Y.; Stark, Casper F.; and Crippen, Thomas E., to Pfizer Hospital Products Group, Inc. Composite orthopedic implant. 5,181,930, Cl. 623-23.000.
Dumfries, David H.: *See*—
Cody, Ian A.; Dumfries, David H.; Neal, Arthur H.; and Riley, Kenneth L., 5,182,248, Cl. 502-230.000.
Dunn, Arthur E.: *See*—
Kroll, Arthur S.; Dunn, Arthur E.; DeCecca, Michael L.; Gaudino, David M.; Livadas, Jerry E.; Fairport, David R.; and Rydelek, James G., 5,182,608, Cl. 355-326.000.
Dunn, William F.: *See*—
Pollack, Richard S.; Phelan, John R.; Ames, Ronald M.; Starkey, Gene R.; Brown, Robert W.; Belski, Gary T.; and Dunn, William F., 5,181,975, Cl. 152-152.100.
Du Pont de Nemours, E. I., and Company: *See*—
Antonelli, Joseph A.; Lin, Tyau-Jeen; Yang, Duck J.; and Yasuda, Hirotsugu, 5,182,000, Cl. 204-181.100.
Arduengo, Anthony J., III, 5,182,405, Cl. 548-335.100.
Bartlett, Philip L.; Bivens, Donald B.; Lunger, Brooks S.; and Yokozeki, Akimichi, 5,182,040, Cl. 252-67.000.
Berecz, Imre, 5,182,060, Cl. 264-70.000.
Chao, Tze, 5,181,956, Cl. 75-743.000.
Chiou, Minshon J., 5,182,067, Cl. 264-184.000.
Daub, John P.; Lahm, George P.; and Marlin, Bradford S., 5,182,303, Cl. 514-583.000.
Dawes, James W., 5,182,322, Cl. 524-308.000.
Ebersole, Richard C.; and Moran, John R., 5,182,203, Cl. 435-196.000.
Feiring, Andrew E.; Krespan, Carl G.; Resnick, Paul R.; Smart, Bruce E.; Treat, Theodore A.; and Wheland, Robert C., 5,182,342, Cl. 526-206.000.
Gambogi, William J., Jr.; and Melega, Robert G., 5,182,180, Cl. 430-1.000.
Grot, Walther G., 5,181,791, Cl. 401-266.000.
Stephenson, Maurice A. S., 5,182,174, Cl. 428-450.000.
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Duren, Richard E.; and Morris, Stanley V., to Exxon Production Research Company. Reduction of sideswipe noise from seismic data by null steering. 5,182,729, Cl. 367-38.000.
Durler, Egon, to Mannesmann Aktiengesellschaft. Device for actuating a tilting lever used in sensing sheet-type recording media. 5,181,801, Cl. 400-708.000.
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Lyons, John E.; and Magrane, Joseph, 5,181,314, Cl. 29-796.000.
Duty, Michael S.: *See*—
Adelman, Roger; and Duty, Michael S., 5,182,542, Cl. 340-521.000.
Dutzmann, Stefan: *See*—
Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hanssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,182,286, Cl. 514-256.000.
Dwyer, Francis G.; Chu, Pochen; and Cormier, William E., Jr., to Mobil Oil Corp. Synthesis of large crystal size ZSM-5. 5,182,090, Cl. 423-704.000.
Dyer, Cheryl A.; Curtiss, Linda K.; and Smith, Richard, to Scripps Research Institute, The. Polypeptide analogs of apolipoprotein E. 5,182,364, Cl. 530-324.000.
Dykstra, Ronald A.: *See*—
Arbisi, Thomas E.; Dykstra, Ronald A.; and Stannis, Gordon J., 5,182,675, Cl. 359-841.000.
E.G.O. Elektro-Gerate Blanc u. Fischer: *See*—
Gross, Martin, 5,181,312, Cl. 29-611.000.
E. Lead Electronic Co., Ltd.: *See*—
Chen, Tonny, 5,182,688, Cl. 360-94.000.
E & M Lamort (Societe Anonyme): *See*—
Lamort, Jean-Pierre, 5,182,031, Cl. 210-781.000.
Eairheart, Daniel L. Pad support assembly for floor polishing machine. 5,181,291, Cl. 15-98.000.
Earls, Jimmy D.: *See*—
Hefner, Robert E., Jr.; and Earls, Jimmy D., 5,182,340, Cl. 525-525.000.
East China University of Chemical Technology: *See*—
Wang, Ren; Wu, Shanliang; and Zhang, Zhigang, 5,182,249, Cl. 502-303.000.
Eastman Kodak Company: *See*—
Bagchi, Pranab; and Sargeant, Steven J., 5,182,189, Cl. 430-449.000.
Bagrodia, Shriram; Fagerburg, David R.; Watkins, Joseph J.; and Lawrence, Paul B., 5,182,345, Cl. 525-462.000.
Betensky, Ellis I.; and Ruben, Paul L., 5,182,592, Cl. 354-221.000.
Chang, Win-Chyi, 5,182,647, Cl. 358-213.110.
Cook, Phillip M.; and Kashdan, David S., 5,182,379, Cl. 536-63.000.
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul M., 5,181,329, Cl. 34-156.000.
Kroll, Arthur S.; Dunn, Arthur E.; DeCecca, Michael L.; Gaudino, David M.; Livadas, Jerry E.; Fairport, David R.; and Rydelek, James G., 5,182,608, Cl. 355-326.000.
Kurtz, Clark N.; and Miceli, Joseph J., Jr., 5,182,735, Cl. 369-13.000.
Lee, J. Kelly; Reznik, Svetlana; and Regelsberger, Matthias H., 5,182,062, Cl. 264-129.000.
Le Faou, Jacques; and Hervieux, Jean-Claude, 5,182,190, Cl. 430-546.000.
Radtke, Manfred, 5,181,309, Cl. 29-465.000.
Radtke, Manfred, 5,181,643, Cl. 227-110.000.
Rudak, Peter; and Hadgis, George A., 5,182,778, Cl. 382-54.000.
Stephenson, Stanley W., III, 5,182,652, Cl. 358-296.000.
Eaton Corporation: *See*—
Baran, Michael, 5,182,461, Cl. 307-41.000.
Eaton, Douglas G.; and Wallace, Robert D., to Eaton, Douglas G. Storage apparatus for storing a necktie. 5,181,670, Cl. 242-67.10R.
Eberline, Joseph. Tool and method for installing tile. 5,181,326, Cl. 33-527.000.
Ebersole, Richard C.; and Moran, John R., to Du Pont de Nemours, E. I., and Company. Bifunctional compounds useful in catalyzed reporter deposition. 5,182,203, Cl. 435-196.000.
Ebert, Gerlinde: *See*—
Engelhardt, Friedrich; and Ebert, Gerlinde, 5,182,312, Cl. 521-149.000.
Ebisawa, Toshihide: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.
Ecolab Inc.: *See*—
Schmidt, Bruce E.; and Swerts, Robert E. F., 5,182,035, Cl. 252-34.000.
Eddison, Alan: *See*—
Askew, Warren E.; and Eddison, Alan, 5,181,576, Cl. 175-61.000.
Edens, William L., to ICI Americas, Inc. Apparatus for production of free flowing polytetrafluoroethylene (PTFE) molding pellets. 5,182,119, Cl. 425-222.000.
Edo, Hiroshi; Bannai, Takashige; Hayashi, Toshihiro; and Sugie, Masayuki, to Asahi Denka Kogyo Kabushiki Kaisha. Composite laminated dough. 5,182,123, Cl. 426-19.000.
Edwards, Johnny W. Adjustable stand apparatus. 5,181,681, Cl. 248-125.000.
Edwards, Richard M.; and Burke, Julian F., to British Bio-Technology Limited. DNA sequence for horseradish peroxidase C modified for expression in mammalian cells. 5,182,376, Cl. 536-23.200.
EEV Limited: *See*—
Robertson, Mark A., 5,182,493, Cl. 315-39.610.
Efland, Taylor R.: *See*—
Malhi, Satwinder; and Efland, Taylor R., 5,182,222, Cl. 437-41.000.
EG&G Idaho, Inc.: *See*—
Beller, Laurence S., 5,181,778, Cl. 374-119.000.
Egloff, Beat, to Emhart Glass Machinery Investments, Inc. Push out device for a glassware forming machine. 5,181,949, Cl. 65-375.000.
Egner-Walter, Bruno: *See*—
Baumgarten, Peter; Egner-Walter, Bruno; Schmid, Eckhardt; and Scholl, Wolfgang, 5,181,293, Cl. 15-250.210.
Eguchi, Ken: *See*—
Yanagisawa, Yoshihiro; Sakai, Kunihiro; Takamatsu, Osamu; Eguchi, Ken; Matsuda, Hiroshi; Kawade, Hisaaki; and Takeda, Toshihiko, 5,182,724, Cl. 365-151.000.
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Egusa, Naoyuki: *See*—
Kime, Kenjiro; Egusa, Naoyuki; and Nakamura, Keiji, 5,182,739, Cl. 369-44.150.
Eichberger, Bernd: *See*—
Feichtiger, Dieter; and Eichberger, Bernd, 5,181,749, Cl. 285-26.000.
Eiermann, Kenneth L. Method and apparatus for latent heat extraction. 5,181,552, Cl. 165-21.000.
Eisai Co., Ltd.: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori,

Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.
Ejiri, Koichi, to Ricoh Corporation; and Ricoh Co. Ltd. Method and apparatus for classifying text. 5,182,708, Cl. 364-419.000.
Eklund, Nils O.; Olsson, Johan L.; and Strom, Lars-Magnus, to Nordiskafilt AB. Wet press felt to be used in papermaking machine. 5,182,164, Cl. 428-234.000.
Electrovert Ltd.: *See*—
Kidd, Thomas F.; and Thompson, Stephen A., 5,181,551, Cl. 164-113.000.
Elias, Lorne; Lawrence, Andre H.; and Lemon, Francis W., to National Research Council of Canada. Thermally-releasable-sample collecting device. 5,181,427, Cl. 73-863.120.
Ellis, Mary J.: *See*—
McDermott, Susan M.; and Ellis, Mary J., 5,181,627, Cl. 220-404.000.
Elopak Systems AG: *See*—
Tanttu, Pekka; and Valkeinen, Osmo E. O., 5,181,652, Cl. 229-243.000.
El-Wailly, Tamim F.: *See*—
Bielas, Michael S.; and El-Wailly, Tamim F., 5,182,611, Cl. 356-350.000.
Emany, Venkateswara R.: *See*—
Michel, M. John; Snyder, Frederick D.; and Emany, Venkateswara R., 5,181,507, Cl. 128-201.250.
Emerson Electric Co.: *See*—
Terpstra, Daniel A., 5,181,448, Cl. 83-468.300.
Theising, John L., 5,181,446, Cl. 83-438.000.
Emhart Glass Machinery Investments, Inc.: *See*—
Egloff, Beat, 5,181,949, Cl. 65-375.000.
Emmons, J. Bruce. Open framework disc brake caliper having an elastomeric cylinder liner. 5,181,588, Cl. 188-73.310.
Emory University: *See*—
Mezrow, Craig K.; Hunter, Robert L.; and Bennett, Carol E., 5,182,106, Cl. 424-78.310.
Encon Safety Products: *See*—
Zachry, Woodie M., Jr., 5,181,280, Cl. 2-452.000.
Endo, Michiaki, to Canon Kabushiki Kaisha. Corona discharging apparatus with automatic cleaning mechanism for corona wire. 5,182,694, Cl. 361-229.000.
Endo, Youichi: *See*—
Ono, Takahiko; and Endo, Youichi, 5,181,504, Cl. 128-36.000.
Engel, Richard B.; Gallo, John B.; Bladen, Donald H.; and Engel, Virginia F., to Tri-O-Clean Laundry Systems, Inc. Laundry waste water treatment and wash apparatus. 5,181,399, Cl. 68-13.00R.
Engel, Virginia F.: *See*—
Engel, Richard B.; Gallo, John B.; Bladen, Donald H.; and Engel, Virginia F., 5,181,399, Cl. 68-13.00R.
Engelhardt, Friedrich; and Ebert, Gerlinde, to Cassella Aktiengesellschaft. Hydrophilic, swellable polymers. 5,182,312, Cl. 521-149.000.
Englehard Corporation: *See*—
Brown, Stephen H.; and von Ballmoos, Roland, 5,182,243, Cl. 502-79.000.
Engler, Heidrun: *See*—
Morsdorf, Peter; Engler, Heidrun; Schickaneder, Helmut; and Ahrens, Kurt-Henning, 5,182,294, Cl. 514-341.000.
Engler, Leonard W., to TRW Inc. Rack bushing with integral seal. 5,181,581, Cl. 180-148.000.
Enichem S.p.A.: *See*—
Caldwell, J. Brian; Banash, Mark A.; Che, Tessie M.; Mininni, Robert M.; and Warden, Victor N., 5,182,236, Cl. 521-12.000.
Ensci, Inc.: *See*—
Clough, Thomas J.; Grosvenor, Victor L.; and Pinsky, Naum, 5,182,165, Cl. 428-263.000.
Enthone-OMI Inc.: *See*—
Haydu, Juan; Paneccasio, Vincent, Jr.; and Cacciatore, Patricia A., 5,182,006, Cl. 205-213.000.
Epping, William R. Harmonica. 5,182,413, Cl. 84-377.000.
Equitime, Inc.: *See*—
Terzian, Berj A., 5,182,733, Cl. 368-82.000.
Erb, Allen J., to International Business Machines Corporation. Aqueous photoresist waste treatment by acid/cupric chloride precipitation. 5,182,029, Cl. 210-724.000.
Erdelen, Christoph: *See*—
Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hanssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,182,286, Cl. 514-256.000.
Erdelsky, Joseph J.: *See*—
Buckshaw, Thomas M.; Erdelsky, Joseph J.; and Martin, David M., 5,182,539, Cl. 337-310.000.
Erdelyi, Charles K.; Marshall, Mark G.; Mathews, John W.; and Perry, Patrick E., to International Business Machines Corporation. Current limiting clamp circuit. 5,182,468, Cl. 307-296.100.
Erickson, John H.; and Tepper, John C., to American Medical Electronics, Inc. Double-transducer system for PEMF Therapy. 5,181,902, Cl. 600-13.000.
Ericson, Thomas H. Label dispensing sheet. 5,182,152, Cl. 428-42.000.
Erlich, Frederick, to PRN Services, Inc. Catheter with check valve and rolled sheath. 5,181,913, Cl. 604-263.000.
Ersek, Tibor: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 5,182,277, Cl. 514-231.200.
Ertel, Gernot; Brabetz, Ludwig; and Schwarz, Waldemar, to Siemens Aktiengesellschaft. Apparatus for ascertaining the alcohol content or calorific value of a mixture by capacitance measurement. 5,182,523, Cl. 324-663.000.
Escalon Ophthalmics, Inc.: *See*—
Blumenkanz, Mark S.; and Wang, Carl, 5,181,922, Cl. 606-202.000.
Esch, Frederick S.: *See*—
Ling, Nicholas C. K.; Ueno, Naoto; Shimasaki, Shunichi; Esch, Frederick S.; Ying, Shao-Yao; and Guillemin, Roger C. L., 5,182,375, Cl. 536-23.500.
Escoto, Dario; and Spector, George. Tooth cleaning kit for vending machines. 5,181,531, Cl. 132-308.000.
Eslambolchi, Hossein: *See*—
Askew, James D.; Chao, Chin-Wang; Cochran, David R.; Dollard, Peter M.; Eslambolchi, Hossein; Goodson, William E.; Guenther, Robert P.; Mansour, Omar M.; Nguyen, Liem T.; and Tanuku, Sarma S., 5,182,744, Cl. 370-16.000.
Essilor International CIE Generale d'Optique: *See*—
Joncour, Christian; Chansavoir, Alain; and Marande, Bruno, 5,181,344, Cl. 51-165.750.
Estell, David A.; Bott, Richard R.; Power, Scott D.; and Wells, James A., to Genencor International, Inc. Non-human carbonyl hydrolase mutants, vectors encoding same and hosts transformed with said vectors. 5,182,204, Cl. 435-222.000.
Esvan, Daniel; and Roisin, Jean P., to Serbio. Apparatus for detecting a change of viscosity by measuring a relative slip, in particular for detecting the coagulation rate of blood. 5,181,415, Cl. 73-54.280.
Etablissements Gouttebarge: *See*—
Gouttebarge, Jean C., 5,181,321, Cl. 30-357.000.
Eureka Acquisition Corp.: *See*—
Thomas, Howard C., 5,181,824, Cl. 414-751.000.
Evans, Alfred G., to United States Surgical Corporation. Apparatus and method for testing point sharpness of needles. 5,181,416, Cl. 73-104.000.
Evans, Alfred J., to Delaware Capital Formation, Inc. Die construction for clipper mechanism. 5,181,302, Cl. 29-243.560.
Evans, Jillian F.: *See*—
Gillard, John W.; Gauthier, Jacques-Yves; Evans, Jillian F.; Fortin, Rejean; Guinon, Yvan; Dixon, Richard A. F.; and Miller, Douglas K., 5,182,367, Cl. 530-350.000.
Evernham, Jeffrey T.: *See*—
Widnall, Sheila E.; Widnall, William S.; Gorgen, William E.; and Evernham, Jeffrey T., 5,181,678, Cl. 244-219.000.
Everts, Robert G., to Inertia Dynamics Corporation. Battery powered line trimmer. 5,181,369, Cl. 56-12.700.
Ewald, Henry J.: *See*—
Slotkowski, Kenneth G.; Michaels, Paul A.; Macks, Harold R.; and Ewald, Henry J., 5,182,502, Cl. 315-159.000.
Ewing, David: *See*—
Munich, Randy; Ewing, David; Lo, Tsai; Sheldrick, Wayne; and Chieh, Baldwin, 5,182,771, Cl. 380-5.000.
Exxon Chemical Patents Inc: *See*—
Fusco, James V.; Wang, Hsien-Chang; and Powers, Kenneth W., 5,182,350, Cl. 526-308.000.
Exxon Chemical Patents, Inc.: *See*—
Miller, John C.; and Welch, William E., 5,182,039, Cl. 252-61.000.
Petersen, Philip R.; Robbins, III: Frederick P.; and Winston, William G., 5,182,013, Cl. 208-348.000.
Powers, Kenneth W.; Wang, Hsien-Chang; Handy, Debra C.; and Fusco, James V., 5,182,333, Cl. 525-315.000.
Wick, Richard J., 5,182,069, Cl. 264-210.200.
Exxon Production Research Company: *See*—
Duren, Richard E.; and Morris, Stanley V., 5,182,729, Cl. 367-38.000.
Exxon Research and Engineering Company: *See*—
Chen, Tan-Jen, 5,182,024, Cl. 210-654.000.
Cody, Ian A.; Dumfries, David H.; Neal, Arthur H.; and Riley, Kenneth L., 5,182,248, Cl. 502-230.000.
Murphy, William J.; and Shaw, David H., 5,181,998, Cl. 204-157.150.
Faarup, Peter: *See*—
Jorgensen, Anker S.; Stidsen, Carsten E.; Faarup, Peter; Gronvald, Frederik C.; and Nielsen, Flemming E., 5,182,279, Cl. 514-250.000.
Faas, Jurg: *See*—
Demuth, Robert; and Faas, Jurg, 5,181,295, Cl. 19-65.00A.
Fabris, Armando A.; to Carraro SpA. Joint structure for connecting a driving steerable wheel hub to an axle, particularly for agricultural tractors. 5,181,885, Cl. 464-170.000.
Fabry, Bernd: *See*—
Klueppel, Hans-Juregen; and Fabry, Bernd, 5,182,100, Cl. 424-49.000.
Faessler, Court; and MacKenzie, Kirk J. Cable lock assembly. 5,181,402, Cl. 70-18.000.
Fagerburg, David R.: *See*—
Bagrodia, Shriram; Fagerburg, David R.; Watkins, Joseph J.; and Lawrence, Paul B., 5,182,345, Cl. 525-462.000.
Faigle, Ernst M.: *See*—
Lenzen, Reiner; Faigle, Ernst M.; and Semchena, John H., 5,181,737, Cl. 280-732.000.
Fairport, David R.: *See*—
Kroll, Arthur S.; Dunn, Arthur E.; DeCecca, Michael L.; Gaudino, David M.; Livadas, Jerry E.; Fairport, David R.; and Rydelek, James G., 5,182,608, Cl. 355-326.000.
Falk, Bernhard: *See*—
Ruff, Klaus; Falk, Bernhard; and Liesching, Detlef, 5,182,095, Cl. 423-659.000.

Fan, Eugene; Chen, Fon-Chiu M.; Milner, Michael W.; and Rehg, Leslie J., to Pacific Biotech, Inc. Occult blood sampling device and assay. 5,182,191, Cl. 435-7.900.

Fanciano, Carlo A.: *See—*
Bruzzese, Tiberio; Signorini, Massimo; Fanciano, Carlo A.; and Termini, Roberta, 5,182,265, Cl. 514-18.000.

Fanuc Ltd.: *See—*
Matsuura, Hitoshi, 5,182,714, Cl. 364-474.030.
Nakata, Yoshinori, 5,182,434, Cl. 219-121.720.

Farley, Brian E.: *See—*
Mueller, Richard L.; Farley, Brian E.; and Pfeiffer, James F., 5,181,920, Cl. 606-159.000.

Farley, Joseph D.; and Fattori, Frank, to Texas Instruments Incorporated. Integrated circuit having bipolar transistors and field effect transistors respectively using potentials of opposite polarities relative to substrate. 5,182,469, Cl. 307-296.200.

Farradyne Systems, Inc.: *See—*
Sumner, Roy L., 5,182,555, Cl. 340-905.000.

Farrell, Joseph K.; Gordon, Jeffrey S.; Kuhl, Daniel C.; and Lee, Timothy V., to International Business Machines Corporation. Direct memory access controller with adaptive pipelining and bus control features. 5,182,800, Cl. 395-425.000.

Farrow, Robert I.; Johnson, Drey; and Gaude, Robert, to Concept Design. Cassette loader with precision cassette extraction and winding reference positioning means and method. 5,181,667, Cl. 242-56.00R.

Farrow, Robert I.: *See—*
Johnson, Drey; Gaude, Robert; Farrow, Robert I.; DeMint, Paul; and McNeill, Ray O., 5,181,669, Cl. 242-56.00R.

Fattori, Frank: *See—*
Farley, Joseph D.; and Fattori, Frank, 5,182,469, Cl. 307-296.200.

Favre, Christian; and Van den Bossche, Dominique, to Aerospatial Societe Nationale Industrielle. Hydrostatic operating mode hydraulic actuator preferably for backup operation, and flight control system comprising it. 5,181,380, Cl. 60-405.000.

Fearnside, James T.: *See—*
Solomon, Rodney J.; Mason, Martin K.; Gruner, George; and Fearnside, James T., 5,181,514, Cl. 128-660.090.

Featherstone, John L.: *See—*
Gallup, Darrell L.; and Featherstone, John L., 5,182,027, Cl. 210-696.000.

Feichtiger, Dieter; and Eichberger, Bernd, to Mercedes-Benz AG. Apparatus for supporting the simultaneous establishment of a plurality of parallel, fluid plug connections. 5,181,749, Cl. 285-26.000.

Feinroth, Herbert, to Gamma Engineering Corporation. Water cooled nuclear reactor and fuel elements therefor. 5,182,077, Cl. 376-416.000.

Feiring, Andrew E.; Krespan, Carl G.; Resnick, Paul R.; Smart, Bruce E.; Treat, Theodore A.; and Wheland, Robert C., to Du Pont de Nemours, E. I., and Company. Hydrofluorocarbon solvents for fluoromonomer polymerization. 5,182,342, Cl. 526-206.000.

Felder, Ernst; Fumagalli, Luciano; Uggeri, Fulvio; and Vittadini, Giorgio, to Bracco Industria Chimica S.p.A. Paramagnetic chelates. 5,182,370, Cl. 534-16.000.

Ferguson, Gregory A. Tractor feed for perforated webs. 5,181,641, Cl. 226-74.000.

Ferguson, James; and Pelletier, Luc, to GEOsurv, Inc.; and Photocompilation PMS, Inc. Method and apparatus for utilizing a movable GPS antenna for surveying purposes. 5,182,566, Cl. 342-357.000.

Ferrarese, Steven M.: *See—*
Frielinghaus, Klaus; and Ferrarese, Steven M., 5,181,679, Cl. 246-182.00R.

Ferrell, Landon W. Nail driver. 5,181,644, Cl. 227-147.000.

Fiat Auto S.P.A.: *See—*
Pattano, Pietro, 5,181,887, Cl. 474-101.000.

Fiat Auto SpA: *See—*
Da Re', Mario, 5,182,335, Cl. 525-30.000.

Fieldler, Gerhard; and Conzelmann, Gerhard, to Robert Bosch GmbH. Interference protected electronic apparatus. 5,182,531, Cl. 333-167.000.

Fiene, Rudiger; and Mayerbock, Wilhelm, to BOGE Aktiengesellshaft. Hydraulically damping rubber bearing. 5,181,698, Cl. 267-140.120.

Fini Elecltrocostruzioni Meccaniche S.p.A.: *See—*
Zecchini, Franco, 5,181,840, Cl. 417-364.000.

Finicle, Robert L., to Praxair S.T. Technology, Inc. Boron nitride boat and process for producing it. 5,182,149, Cl. 428-34.600.

Finkiewicz, Daniel J.: *See—*
Kuhlman, Marvin G.; Finkiewicz, Daniel J.; and Gradecki, Raymond J., 5,181,464, Cl. 101-28.000.

Finn Corporation: *See—*
Wysong, Douglas E.; and Bedel, Joseph A., 5,181,804, Cl. 406-67.000.

Finnigan Corporation: *See—*
Schwartz, Jae C.; Syka, John E. P.; and Louris, John N., 5,182,451, Cl. 250-282.000.

Fischer, Andrew: *See—*
Sager, Paul, 5,181,684, Cl. 248-231.600.

Fischer Industries, Inc.: *See—*
Fischer, Warren, 5,182,593, Cl. 354-322.000.

Fischer, Mark R.: *See—*
Hofstra, Joseph S.; Karaskiewicz, Ronald J.; and Fischer, Mark R., 5,181,883, Cl. 454-49.000.

Fischer, Warren, to Fischer Industries, Inc. Roller tank. 5,182,593, Cl. 354-322.000.

Fish, Donald D.; and Standish, James K., to W. F. Meyers Company, Inc. Stone slab saw. 5,181,503, Cl. 125-21.000.

Fitch, John J., to Van Leer Metallized Products (U.S.A.) Limited. Method of forming a coated sheet which wicks away oil and product thereof. 5,182,157, Cl. 428-137.000.

Fitzgerald, Thomas W.: *See—*
Tabasky, Marvin; Cataldo, Victor; Fitzgerald, Thomas W.; Chirravuri, Jagannath; Armiento, Craig A.; and Haugsjaa, Paul O., 5,182,782, Cl. 385-89.000.

Fitzgibbons, Patrick J.; Lee, Ho C.; Stone, Lawrence A.; and Van Note, Paul C., to International Business Machines Corporation. Ribbon guide system for a line printer. 5,181,465, Cl. 101-103.000.

Flam, Eric. Method of monitoring the condition of the skin or wound. 5,181,905, Cl. 602-41.000.

Fletcher, Paul: *See—*
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Fletton, Richard A.: *See—*
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 5,182,207, Cl. 435-253.500.

Flex Foil Technology, Inc.: *See—*
Widnall, Sheila E.; Widnall, William S.; Gorgen, William E.; and Evernham, Jeffrey T., 5,181,678, Cl. 244-219.000.

Flexco Microwave, Inc.: *See—*
Pote, William; Johansen, Roger; and Pote, Thomas, 5,181,316, Cl. 29-828.000.

Flisram, Dennis G., to Oscar Mayer Foods Corporation. Food slicing with multiple cutting surface blade. 5,181,665, Cl. 241-292.100.

Florek, Stefan; Guther, Reiner; and Becker-Ross, Helmut, to Zentralinstitut fur Optik und Spektroskopie. Spectrometer. 5,182,609, Cl. 356-328.000.

Flotow, Richard A.; and Lewis, J. Michael, to Dana Corporation. Clutch wear indicator apparatus. 5,181,593, Cl. 192-30.00W.

Flow-Rite Controls, Ltd.: *See—*
Campau, Daniel N., 5,181,540, Cl. 137-625.460.

Floyd, Grady O.: *See—*
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.

Fluor Corporation: *See—*
Rao, Ashok D., 5,181,376, Cl. 60-39.050.

FMC Corporation: *See—*
Lill, Melvin H., 5,182,614, Cl. 356-376.000.

Focke, Bernhard: *See—*
Focke, Heinz; and Focke, Bernhard, 5,181,607, Cl. 206-273.000.

Focke & Company: *See—*
Focke, Heinz; and Focke, Bernhard, 5,181,607, Cl. 206-273.000.

Focke, Heinz; and Focke, Bernhard, to Focke & Company. Divisible package for a plurality of cigarette packs. 5,181,607, Cl. 206-273.000.

Fong, Ronald A.: *See—*
Rowland, Richard R.; Fong, Ronald A.; Wiersema, Richard J.; and Zielske, Alfred G., 5,182,045, Cl. 252-186.380.

Ford Motor Company: *See—*
Kummer, Joseph T., 5,181,995, Cl. 204-101.000.
Slotkowski, Kenneth G.; Michaels, Paul A.; Macks, Harold R.; and Ewald, Henry J., 5,182,502, Cl. 315-159.000.

Foreman, Kevin G.; and Miller, Paul J., to TRW Inc. Electrical connector circuit wafer. 5,181,859, Cl. 439-225.000.

Forr, John P.: *See—*
Koontz, Harry S.; and Forr, John P., 5,182,431, Cl. 219-203.000.

Forschungszentrum Julich GmbH: *See—*
Chakraborty, Amiya K.; Rohde, Jurgen; Klatt, Karl-Heinz; Wenzl, Helmut; and Konrad, Ralf, 5,181,845, Cl. 431-7.000.

Forsberg, Alf; and Fredriksson, Boris, to ITT Flygt AB. Seal device. 5,181,729, Cl. 277-62.000.

Fortin, Francois: *See—*
Dufour, Denis; and Fortin, Francois, 5,182,440, Cl. 219-535.000.

Fortin, Rejean: *See—*
Gillard, John W.; Gauthier, Jacques-Yves; Evans, Jillian F.; Fortin, Rejean; Guinon, Yvan; Dixon, Richard A. F.; and Miller, Douglas K., 5,182,367, Cl. 530-350.000.

Foster, Glenn D.; and Moses, Charlie. Residential heating and air conditioning control system. 5,181,653, Cl. 236-49.300.

Foster Wheeler Energy Corporation: *See—*
Dietz, David H., 5,181,481, Cl. 122-4.00D.

Framatome: *See—*
de Seroux, Nicolas; and Limouzin, Dominique, 5,182,076, Cl. 376-250.000.

Frame, Robert C.: *See—*
DeRoo, John E.; Frame, Robert C.; and Solli, Ann, 5,182,752, Cl. 371-37.700.

France Telecom: *See—*
Bosc, Dominique; Guilbert, Martine; and Toinen, Christian, 5,182,783, Cl. 385-123.000.

Francisco, Robert, to Pitney Bowes Inc. Multiple material processing system start-up. 5,182,798, Cl. 395-200.000.

Francois, Michael J.: *See—*
Siegel, Marvin; Donohue, William; and Francois, Michael J., 5,182,543, Cl. 340-531.000.

Frank, Lee F.: *See—*
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul M., 5,181,329, Cl. 34-156.000.

Frank, Vlastimil. Module encapsulation by induction heating. 5,182,424, Cl. 219-10.530.

Frankel, Julius; and Doxbeck, Mark, to United States of America, Army. Ultrasonic realtime determination and display of thickness of chromium on gun barrels. 5,182,139, Cl. 427-9.000.

Fredriksson, Boris: *See—*
Forssberg, Alf; and Fredriksson, Boris, 5,181,729, Cl. 277-62.000.

Freedman, Jules; and Bitonti, Alan J., to Merrell Dow Pharmaceuticals Inc. Bis-dibenzoazepine compounds. 5,182,387, Cl. 540-590.000.

Freedy, Amos: *See—*
Bergman, Arieh; Freedy, Amos; and Vermesh, Michael, 5,181,919, Cl. 606-144.000.

Frenzel, James F., III; and Youngman, Brian A., to International Business Machines Corporation. Method for controlling the insertion of stations into FDDI network. 5,182,747, Cl. 370-85.500.

Friden, Phillip M., to Alkermes, Inc. Transferrin receptor specific antibody-neuropharmaceutical or diagnostic agent conjugates. 5,182,107, Cl. 424-85.910.

Friedman, Michael. Rain cap system for fast modular structures. 5,181,352, Cl. 52-58.000.

Friele Trading A/S: *See—*
Hjertholm, Ole G., 5,181,730, Cl. 277-167.500.

Frielinghaus, Klaus; and Ferrarese, Steven M., to General Railway Signal Corporation. Railway train speed restriction apparatus. 5,181,679, Cl. 246-182.00R.

Friend, William H.: *See—*
White, David E.; Pikulin, Michael A.; Gandek, Thomas P.; and Friend, William H., 5,181,989, Cl. 162-241.000.

Frigola-Constansa, Jordi; and Pares-Corominas, Juan, to Laboratorios Del Dr. Esteve, S.A. (Omega-(4-(2-pyrimidinyl)-1-piperazinyl)alkyl)-1H-azole derivatives for the treatment of disorders of cognitive functions. 5,182,281, Cl. 514-252.000.

Frigola-Constansa, Jordi: *See—*
Cuberes-Altisent, Maria R.; Frigola-Constansa, Jordi; and Pares-Corominas, Juan, 5,182,280, Cl. 514-252.000.

Fritsche, Wolf E.; Lubbehusen, Michael; Kukla, Reiner; and BeiBwenger, Siegfried, to Leybold Aktiengesellschaft. Process for coating substrates by means of a magnetron cathode. 5,182,001, Cl. 204-192.120.

Fritz, Denise: *See—*
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Fromm Holding AG: *See—*
Synek, Wenzel, 5,181,546, Cl. 140-93.400.

Frost, John H. Sandwich serving container. 5,181,649, Cl. 229-19.000.

Fuchikami, Takamasa; Ubukata, Yumiko; and Tanaka, Yasutaka, to Sagami Chemical Research Center. Catalyst for hydrogenation, dehydrosilylation or hydrosilylation and use thereof. 5,182,246, Cl. 502-161.000.

Fuhren, Marcel, to U.S. Philips Corporation. Method for encoding and extended composite television signal with crosstalk compensation and apparatus for decoding. 5,182,634, Cl. 358-12.000.

Fuji Electric Co., Ltd.: *See—*
Ohiwa, Kiyoshi, 5,181,986, Cl. 156-643.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Takahashi, Tsutomu; Oshita, Saiichiro; and Mouri, Toyohiko, 5,182,711, Cl. 364-424.050.

Fuji Photo Film Co., Ltd.: *See—*
Inagaki, Yoshio; Adachi, Keiichi; and Yabe, Masao, 5,182,186, Cl. 430-270.000.
Kaneko, Nobuyoshi; and Kakei, Tsutomu, 5,181,997, Cl. 204-129.100.
Kataoka, Hideaki, 5,181,672, Cl. 242-71.100.
Mizuno, Kazunori, 5,181,671, Cl. 242-71.100.
Takekoshi, Tomoaki, 5,181,467, Cl. 101-147.000.
Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, 5,182,339, Cl. 525-242.000.

Fuji Xerox Co., Ltd.: *See—*
Miyake, Hiroyuki; Abe, Tsutomu; Ito, Hisao; Hotta, Hiroyuki; Shimizu, Yasumoto; and Sakai, Yoshihiko, 5,182,625, Cl. 257-443.000.
Shibayama, Yoshinaru; and Ohtake, Takao, 5,182,796, Cl. 395-156.000.

Fujihira, Mitsuaki, to Sumitomo Electric Industries, Ltd. Production methods for compound semiconductor device having lightly doped drain structure. 5,182,218, Cl. 437-22.000.

Fujii, Mutsumasa: *See—*
Miyashita, Akimi; Fujii, Mutsumasa; Kubosawa, Minoru; Torii, Keiichiro; Ooki, Nobuaki; Kogawa, Kiyonori; Kawaguchi, Masami; Murooka, Hideyasu; and Kyooi, Masayuki, 5,182,121, Cl. 425-338.000.

Fujii, Osamu: *See—*
Yamamoto, Masanori; Nakayama, Toshio; Fujii, Osamu; and Okabe, Rie, 5,182,206, Cl. 435-253.300.

Fujii, Toshiro: *See—*
Ikeda, Hayato; Fujii, Toshiro; Yokomachi, Naoya; and Takemoto, Shoji, 5,181,834, Cl. 417-269.000.

Fujii, Yozo: *See—*
Kakita, Akihiko; Sugizaki, Tsugio; and Fujii, Yozo, 5,182,602, Cl. 355-271.000.

Fujikawa, Takashi: *See—*
Usui, Kazushi; Fujikawa, Takashi; and Ohki, Katsuyoshi, 5,182,250, Cl. 502-314.000.

Fujimori, Tohru: *See—*
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.

Fujimoto, Masaya: *See—*
Saburi, Toshiki; Fujimoto, Masaya; Tsuruta, Tadashi; and Nunogaki, Naochika, 5,182,136, Cl. 427-126.300.

Fujita, Akihiro: *See—*
Jutamulia, Suganda; Fujita, Akihiro; Toyoda, Shinji; Kojima, Atsushi; and Ito, Eiichi, 5,182,639, Cl. 358-81.000.

Fujita, Goro: *See—*
Ohmori, Kiyoshi; Iwaasa, Shoji; and Fujita, Goro, 5,182,742, Cl. 369-116.000.
Watanabe, Tetsu; Kawashima, Tetsuji; and Fujita, Goro, 5,182,734, Cl. 369-13.000.

Fujita, Kazuya: *See—*
Omi, Susumu; and Fujita, Kazuya, 5,182,630, Cl. 257-787.000.

Fujita, Masaki: *See—*
Tamura, Toshiyuki; Fujita, Masaki; Komori, Shinji; Sato, Hisakazu; and Takata, Hidehiro, 5,182,799, Cl. 395-400.000.

Fujitsu Limited: *See—*
Masuda, Toru; and Kamijo, Akinori, 5,182,550, Cl. 340-825.050.
Nishihara, Mikio; Murase, Teruo; Seyama, Kiyotaka; Kuwabara, Kiyoshi; and Ohshima, Osamu, 5,181,317, Cl. 29-401.100.
Shirai, Nobuo; and Kasasaku, Takami, 5,182,762, Cl. 375-122.000.
Tanaka, Kazuhiro, 5,182,788, Cl. 385-131.000.
Yanagi, Shigenori, 5,182,736, Cl. 369-32.000.

Fujitsu Ten Limited: *See—*
Kamimura, Masatsugu, 5,182,723, Cl. 364-748.000.

Fujiwara, Shigeru: *See—*
Ueda, Masanori; Tsuchinaga, Masamitsu; Iura, Teruo; and Fujiwara, Shigeru, 5,181,970, Cl. 148-610.000.

Fukai, Isao: *See—*
Tanigawa, Hiroshi; Kondo, Hiroshi; Fukai, Isao; and Tohyama, Tsuneo, 5,182,522, Cl. 328-167.000.

Fukuchi, Masakazu; Morita, Shizuo; Haneda, Satoshi; Satoh, Hisao; and Ikeda, Tadayoshi, to Konica Corporation. Image forming apparatus having an dismountable process cartridge. 5,182,595, Cl. 355-200.000.

Fukuda Denshi Co., Ltd.: *See—*
Negishi, Kazuaki, 5,181,515, Cl. 128-672.000.

Fukuda, Masatoshi: *See—*
Matsutani, Kanji; Fukuda, Masatoshi; and Sato, Katsutoshi, 5,181,645, Cl. 227-177.000.

Fukuda, Masayuki; and Miura, Sadayoshi, to Teijin Limited. Antistatic highly adhesive film, process for producing said film, and magnetic card using said film. 5,182,169, Cl. 428-343.000.

Fukuda, Minoru: *See—*
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Fukuda, Takuya; Ohue, Michio; and Sonobe, Tadasi, to Hitachi, Ltd. Plasma processing method and apparatus using electron cyclotron resonance. 5,182,495, Cl. 315-111.410.

Fukuda, Tsuguhiro: *See—*
Kashimura, Makoto; Nakagomi, Hiroshi; Karita, Seiichiro; Fukuda, Tsuguhiro; Kimura, Tetsuo; Hirano, Hirofumi; and Kurata, Mitsuru, 5,182,581, Cl. 346-140.00R.

Fukuda, Yasuaki: *See—*
Iizuka, Takashi; Watanabe, Yutaka; and Fukuda, Yasuaki, 5,182,763, Cl. 378-34.000.

Fukui, Hidehiro: *See—*
Fukunaga, Yasuyuki; Kita, Hideki; Nakakuma, Akira; Taniguchi, Toru; Fukui, Hidehiro; and Takemura, Yoshinobu, 5,182,584, Cl. 346-157.000.

Fukui, Hiroshi: *See—*
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Fukumura, Satoshi, to Sente Creations Co., Ltd. Toy game apparatus with vertically extendable appendage. 5,181,727, Cl. 273-450.000.

Fukumura, Teruo: *See—*
Maruyama, Junichi; Fukumura, Teruo; and Kawaguchi, Sadatsugu, 5,181,575, Cl. 173-180.000.

Fukunaga, Yasuyuki; Kita, Hideki; Nakakuma, Akira; Taniguchi, Toru; Fukui, Hidehiro; and Takemura, Yoshinobu, to Mita Industrial Co., Ltd. Multicolor developing device with improved movable frame arrangement. 5,182,584, Cl. 346-157.000.

Fukutani, Iwao: *See—*
Wakino, Kikuo; and Fukutani, Iwao, 5,181,864, Cl. 439-620.000.

Fumagalli, Luciano: *See—*
Felder, Ernst; Fumagalli, Luciano; Uggeri, Fulvio; and Vittadini, Giorgio, 5,182,370, Cl. 534-16.000.

Funkenbusch, Eric F.; Carr, Peter W.; Habggi, Douglas A.; and Weber, Thomas P., to University of Minnesota, Regents of the. Polymer-coated carbon-clad inorganic oxide particles. 5,182,016, Cl. 210-198.200.

Fuoco, Rolland P.: *See*—
Wheat, James A.; Fuoco, Rolland P.; and Dix, J. Kimberley, 5,182,163, Cl. 428-224.000.

Furst, Robert E.: *See*—
Seifert, Keith L.; and Furst, Robert E., 5,182,070, Cl. 264-241.000.

Furukawa, Osamu: *See*—
Handa, Kiyoji; Mukaeda, Satoshi; Kanai, Hideyuki; Yamashita, Yohachi; Furukawa, Osamu; and Harata, Mitsuo, 5,182,695, Cl. 361-321.000.

Furuta, Motonobu; and Tsuji, Mitsuji, to Sumitomo Chemical Company, Limited. Thermoplastic resin composition. 5,182,151, Cl. 428-36.920.

Furutachi, Nobuo: *See*—
Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, 5,182,339, Cl. 525-242.000.

Furuya, Nagakazu, to Furuya, Nagakazu; and Tanaka Kikinzoku Kogyo K.K. Process for converting ferrous ions to ferric ions. 5,181,993, Cl. 204-86.000.

Fusco, James V.; Wang, Hsien-Chang; and Powers, Kenneth W., to Exxon Chemical Patents Inc. Ozone-resistant butyl elastomer. 5,182,350, Cl. 526-308.000.

Fusco, James V.: *See*—
Powers, Kenneth W.; Wang, Hsien-Chang; Handy, Debra C.; and Fusco, James V., 5,182,333, Cl. 525-315.000.

Fuso, Francesco: *See*—
Reinert, Gerhard; and Fuso, Francesco, 5,181,935, Cl. 8-442.000.

Futscher, Paul T. Flicker reduction circuit for interlaced video images. 5,182,643, Cl. 358-140.000.

Fuyama, Moriaki: *See*—
Taguchi, Kazuo; Onisawa, Kenichi; Fuyama, Moriaki; Tamura, Katsumi; Abe, Yoshio; Nakayama, Takahiro; Hashimoto, Kenichi; and Sato, Akira, 5,182,491, Cl. 313-503.000.

G. D. Searle & Co.: *See*—
Hallinan, E. Ann; Husa, Robert K.; and Peterson, Karen B., 5,182,272, Cl. 514-80.000.

Gabriel, Reinhard. Jet propulsion device for watercraft, aircraft, and circulating pumps. 5,181,868, Cl. 440-38.000.

Gabrielson, James E.: *See*—
Breen, Bernard P.; and Gabrielson, James E., 5,181,475, Cl. 110-345.000.

Gaddas, John R.: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Gaggar, Satish K., to General Electric Company. Polymer blend compositions. 5,182,338, Cl. 525-187.000.

Gallo, John B.: *See*—
Engel, Richard B.; Gallo, John B.; Bladen, Donald H.; and Engel, Virginia F., 5,181,399, Cl. 68-13.00R.

Gallup, Darrell L.; and Featherstone, John L., to Union Oil Company of California. Process for treating ammonia and nitrite containing waters to reduce nitrogen oxide emissions therefrom. 5,182,027, Cl. 210-696.000.

Gambogi, William J., Jr.; and Melega, Robert G., to Du Pont de Nemours, E. I., and Company. Dry film process for altering the wavelength of response of holograms. 5,182,180, Cl. 430-1.000.

Gamma Engineering Corporation: *See*—
Feinroth, Herbert, 5,182,077, Cl. 376-416.000.

Gandek, Thomas P.: *See*—
White, David E.; Pikulin, Michael A.; Gandek, Thomas P.; and Friend, William H., 5,181,989, Cl. 162-241.000.

Garbarino, Joseph L.: *See*—
Gray, Lewis; Garbarino, Joseph L.; Micol, John S.; Crenshaw, Johnny W.; Iacono, Vincent M.; Barley, James C.; Hollen, Richard L.; and Graziani, Terry M., 5,181,308, Cl. 29-436.000.

Gariboldi, Roberto; and Gola, Alberto, to SGS-Thomson Microelectronics S.r.l. Negative overvoltage protection circuit, in particular for output stages. 5,182,470, Cl. 307-296.400.

Garland, Stuart M., to AT&T Bell Laboratories. Generalized telecommunications customer signaling arrangement. 5,182,766, Cl. 379-216.000.

Garvey, Joseph F.; Minion, Aaron A.; and Smith, Warren T., to Minnesota Mining and Manufacturing Company. Method and apparatus for forming individual pouches from a continuous web and packaging a product in the individual pouches. 5,181,365, Cl. 53-455.000.

Gasperi, Michael L.; and Davis, Wesley, to Allen-Bradley Company, Inc. Recurrent neural networks teaching system. 5,182,794, Cl. 395-23.000.

Gates Energy Products, Inc.: *See*—
Brizendine, J. David; and Hooke, John, 5,182,178, Cl. 429-160.000.

Gaude, Robert: *See*—
Farrow, Robert I.; Johnson, Drey; and Gaude, Robert, 5,181,667, Cl. 242-56.00R.
Johnson, Drey; Gaude, Robert; Farrow, Robert I.; DeMint, Paul; and McNeill, Ray O., 5,181,669, Cl. 242-56.00R.

Gaudino, David M.: *See*—
Kroll, Arthur S.; Dunn, Arthur E.; DeCecca, Michael L.; Gaudino, David M.; Livadas, Jerry E.; Fairport, David R.; and Rydelek, James G., 5,182,608, Cl. 355-326.000.

Gauthier, Jacques-Yves: *See*—
Gillard, John W.; Gauthier, Jacques-Yves; Evans, Jillian F.; Fortin, Rejean; Guinon, Yvan; Dixon, Richard A. F.; and Miller, Douglas K., 5,182,367, Cl. 530-350.000.

Gaver, Joseph C., Jr.; and Jorgenson, James C., to LRC Electronics, Inc. Manually installable coaxial cable connector. 5,181,861, Cl. 439-578.000.

Gaz de France: *See*—
Dufour, Denis; and Fortin, Francois, 5,182,440, Cl. 219-535.000.

Gazzani, Giovanni, to Crinos Industria Farmacobiologica SpA. Composition for topical use having hair stimulating, anti-dandruff and anti-seborrhoic activity. 5,182,269, Cl. 514-44.000.

Geary, Christopher T.: *See*—
Labbe, Donald E.; Line, Lawrence J.; Geary, Christopher T.; Leigh, Mark C.; and Donohue, John M., 5,181,482, Cl. 122-392.000.

Gebruder Weiss K.G.: *See*—
Kneer, Franz X., 5,181,950, Cl. 71-9.000.

GEC Alsthom SA: *See*—
Petit, Jean-Michel; and Devallez, Alain, 5,181,473, Cl. 105-133.000.

Geerlof, Arie; Groen, Barend; and Duine, Johannis A., to DSM N.V. Enantioselective preparation of s-2R_1,2R_2-1,3-dioxolane-4-methanol and derivatives thereof. 5,182,209, Cl. 435-280.000.

Geerts, Jan C., to Promech Sorting Systems B.V. Conveyor- and distribution plant. 5,181,597, Cl. 198-365.000.

Geimuplast Peter Mundt GmbH & Co. KG: *See*—
Stemmer, Gottfried, 5,181,367, Cl. 53-473.000.

Geissler, Ulrich; and Wiezer, Hartmut, to Hoechst Aktiengesellschaft. Radiation-polymerizable composition and recording material prepared from this composition. 5,182,187, Cl. 430-271.000.

Geldiay-Tuncer, Beril: *See*—
Johnson, Eric A.; Schreiber, David; Ho, Kwok P.; Hall, William T.; Yang, Huei-hsiung; and Geldiay-Tuncer, Beril, 5,182,208, Cl. 435-254.000.

Geleyns, Eduard A.: *See*—
Degrauwe, Dirk M.; Raemdonck, Marcel A.; and Geleyns, Eduard A., 5,181,963, Cl. 118-325.000.

GenCorp Inc.: *See*—
Godwin, James E., 5,181,981, Cl. 156-209.000.

Genencor International, Inc.: *See*—
Estell, David A.; Bott, Richard R.; Power, Scott D.; and Wells, James A., 5,182,204, Cl. 435-222.000.

General Dynamics Lands Systems Inc.: *See*—
Gersdorff, Detlef G.; Giganti, John J.; McCown, Phillip W.; and Sullivan, Timothy A., 5,182,642, Cl. 358-133.000.

General Electric Company: *See*—
Beltran, Adrian M.; and Kreischer, Charles H., 5,182,080, Cl. 420-588.000.
Claesen, Christianus A.; Lohmeijer, Johannus H. G. M.; Boogers, Michael P. J.; Bussink, Jan; Savenije, Hermannus B.; Hoeks, Theodorus L.; and Gosens, Johannes C., 5,182,325, Cl. 524-404.000.
Cole, Herbert S., Jr.; Rose, James W.; Guida, Renato; and Liu, Yung S., 5,182,188, Cl. 430-323.000.
Gaggar, Satish K., 5,182,338, Cl. 525-187.000.
Klein, Keith W., 5,182,532, Cl. 335-35.000.
Lee, Albert C., 5,181,311, Cl. 29-609.000.
Maria van Hout, Hendricus H.; Oyevaar, Martin H.; and Held, Bert J., 5,182,361, Cl. 528-371.000.
Napoli, Phillip D.; and Koshoffer, John M., 5,181,377, Cl. 60-39.310.
Rock, Peter J., 5,181,826, Cl. 415-173.100.
Stec, Philip F., 5,181,728, Cl. 277-53.000.
Wakeman, Thomas G.; Walker, Alan; and Maclin, Harvey M., 5,181,379, Cl. 60-261.000.
Young, John D.; Hedengren, Kristina H.; and Hurley, Donna C., 5,182,513, Cl. 324-232.000.

General Engineering (Netherlands) B.V.: *See*—
Sandvik, Lars V., 5,181,758, Cl. 296-68.100.

General Mills, Inc.: *See*—
Schwab, Edward C.; and Brown, George E., 5,182,127, Cl. 426-241.000.

General Motors Corporation: *See*—
Doolittle, Edson P., 5,181,759, Cl. 296-153.000.
Grochowski, Edwin T., 5,181,792, Cl. 403-359.000.
Meadows, Clarence A., 5,181,936, Cl. 29-623.200.
Rodondi, Andrew F.; Cope, Kenneth P.; Gladd, Joseph H.; and Savich, James R., 5,181,867, Cl. 439-854.000.

General Railway Signal Corporation: *See*—
Frielinghaus, Klaus; and Ferrarese, Steven M., 5,181,679, Cl. 246-182.00R.

Geng, Qiquan: *See*—
Goto, Eiichi; Geng, Qiquan; and Yuyama, Junpei, 5,181,383, Cl. 62-6.000.

Genshaw, Marvin A.; and Pugia, Michael J., to Miles Inc. Method for detecting the presence of peroxidatively active substance in basic media. 5,182,213, Cl. 436-66.000.

Gentile, Joseph P.; and Martin, Vaughn H., to Vamco Machine & Tool, Inc. Press feed apparatus including a linkage mechanism having a three-link assembly for use in rotating stock material feed rolls. 5,181,642, Cl. 226-137.000.

Gentry, Scott B.: *See*—
Bauer, Barney; Blackburn, Brian K.; and Gentry, Scott B., 5,181,739, Cl. 280-807.000.

GEOsurv, Inc.: *See*—
Ferguson, James; and Pelletier, Luc, 5,182,566, Cl. 342-357.000.

Gerber, Arthur H., to Borden, Inc. Accelerators for curing phenolic resole resins. 5,182,346, Cl. 525-503.000.

Gerber, Arthur H., to Borden, Inc. Accelerators for refractory magnesia. 5,182,347, Cl. 525-508.000.

Gerold, Friedrich: *See*—
Horn, Peter; Heckmann, Walter; Ramsteiner, Falko; and Gerold, Friedrich, 5,182,354, Cl. 528-60.000.

Gersdorff, Detlef G.; Giganti, John J.; McCown, Phillip W.; and Sullivan, Timothy A., to General Dynamics Lands Systems Inc. Apparatus and method for the compression and transmission of multiformat data. 5,182,642, Cl. 358-133.000.

Gerth, Wayne A.: *See*—
Vann, Richard D.; and Gerth, Wayne A., 5,181,903, Cl. 600-36.000.

Gesellschaft fur Reaktorsicherheit: *See*—
Chakraborty, Amiya K.; Rohde, Jurgen; Klatt, Karl-Heinz; Wenzl, Helmut; and Konrad, Ralf, 5,181,845, Cl. 431-7.000.

Get-A-Head, Inc.: *See*—
Sherman, Gary A., 5,181,277, Cl. 2-195.000.

Geuns, Guy; and Reinelt, Werner, to Hermann Hemscheidt Maschinenfabrik GmbH & Co. Control system for longwall face support frames. 5,181,451, Cl. 91-170.0MP.

Ghenassia, Elie: *See*—
Commandeur, Raymond; Drivon, Gilles; and Ghenassia, Elie, 5,181,992, Cl. 203-29.000.

Ghoda, Isamu: *See*—
Takuma, Keisuke; Ohyama, Tsukasa; Igata, Akitoshi; Mikoda, Tamio; Ghoda, Isamu; and Koshida, Hitoshi, 5,182,395, Cl. 552-251.000.

Gibilisco, Kenneth J., to Merck & Co., Inc. Recessed tip fluid dispenser. 5,181,634, Cl. 222-212.000.

Giesecke, Henning; Wolf, Gerhard D.; Muller, Hanns P.; von Gizycki, Ulrich; and Wienkenhover, Martin, to Bayer Aktiengeselischaft. Process for improving the adherency of metallic coatings deposited without current on plastic surfaces. 5,182,135, Cl. 427-98.000.

Giftec, Ltd.: *See*—
Hou, Jack, 5,182,144, Cl. 428-16.000.

Giganti, John J.: *See*—
Gersdorff, Detlef G.; Giganti, John J.; McCown, Phillip W.; and Sullivan, Timothy A., 5,182,642, Cl. 358-133.000.

Gilbert, Ronald E.; and Mordue, George S., to Carborundum Company, The. Molten metal pump. 5,181,828, Cl. 415-200.000.

Gilbert, Stephen F., to Paris Manufacturing Co., Inc. Height adjustable pants presser with top finishing. 5,181,333, Cl. 38-15.000.

Gilchrist, Robert T., Jr., to Shell Oil Company. Double pipe turntable and stinger. 5,181,798, Cl. 405-170.000.

Gillard, John W.; Gauthier, Jacques-Yves; Evans, Jillian F.; Fortin, Rejean; Guinon, Yvan; Dixon, Richard A. F.; and Miller, Douglas K., to Merck & Co., Inc.; and Merck Frosst Canada, Inc. 5-lipoxygenase activating protein. 5,182,367, Cl. 530-350.000.

Gillebaard, Hendrik C. Collapsible skimmer. 5,181,283, Cl. 4-496.000.

Gilliem, Donald L., to TRW Inc. Steering and driving system. 5,181,579, Cl. 180-6.480.

Gilman, David J.: *See*—
Lewis, Terence; Bansal, Harjinder S.; Sundley, Raymond L.; Bartley, Michael R.; Hepworth, Walter; Gilman, David J.; Kay, Ian T.; and Collins, David J., 5,182,402, Cl. 548-204.000.

Gilstad, Dennis J.: *See*—
Gilstad, Donald C.; and Gilstad, Dennis J., 5,181,703, Cl. 269-43.000.

Gilstad, Donald C.; and Gilstad, Dennis J. Apparatus for installing wooden decking. 5,181,703, Cl. 269-43.000.

Girard, Marc; Wychowski, Czeslaw; and Martin, Annette, to Institut Pasteur. Plasmid vectors encoding a protein of a picornavirus. 5,182,211, Cl. 435-320.100.

Girardini, Joseph: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Gladd, Joseph H.: *See*—
Rodondi, Andrew F.; Cope, Kenneth P.; Gladd, Joseph H.; and Savich, James R., 5,181,867, Cl. 439-854.000.

Glaunsinger, Georg: *See*—
Merkel, Gerd; Vogt, Wilfried; Glaunsinger, Georg; Stadler, Peter; Zander, Claus-Peter; Maass, Jurgen; Schmitt, Gernot; Necker, Thomas; and Becker, Willi, 5,181,469, Cl. 101-415.100.

Glen, Stephen J.: *See*—
Ward, Peter; and Glen, Stephen J., 5,182,516, Cl. 324-326.000.

Glockler, Rainer: *See*—
Kiener, Andreas; Glockler, Rainer; and Heinzmann, Klaus, 5,182,197, Cl. 435-122.000.

Glover, Richard W., to Lisco, Inc. Heat treated latch plate. 5,181,765, Cl. 297-467.000.

Gneiding, Donald R.; and Peterson, Oscar J., to Circle Seal Controls, Inc. Tire inflation valve having overpressure and flow control. 5,181,977, Cl. 152-429.000.

Goberti, Paolo: *See*—
Bertelli, Guido; Cicchetti, Osvaldo; Goberti, Paolo; and Locatelli, Renato, 5,182,321, Cl. 524-100.000.

Godwin, James E., to GenCorp Inc. Method of embossing thermoplastic material. 5,181,981, Cl. 156-209.000.

Goekler, Lewis E.; and Chamberlin, Edward R., to Standex International Corporation. Fluid level sensor having capacitive sensor. 5,182,545, Cl. 340-620.000.

Goepel, Ernst; and Schierjott, Rudolf, to Mannesmann AG. Heating mechanism for warming the ink in the write head of an ink printer means. 5,182,578, Cl. 346-140.00R.

Gola, Alberto: *See*—
Gariboldi, Roberto; and Gola, Alberto, 5,182,470, Cl. 307-296.400.

Gold Star Electron Co., Ltd.: *See*—
Jang, Seong J., 5,182,226, Cl. 437-70.000.

Goncalves, Carlos Alberto D. C., to Petroleo Brasileiro S.A. - Petrobras. Process of electric pipeline heating utilizing heating elements inserted in pipelines. 5,182,792, Cl. 392-468.000.

Gonsior, Wolfgang, to XOMOX International GmbH & Co. Shut-off valve. 5,181,690, Cl. 251-172.000.

Goodman, Laurence R. Method and apparatus for increasing flotation cell recovery and grade of complex copper-containing ores. 5,182,014, Cl. 209-164.000.

Goodsmith, Dale H., to Multifastener Corporation. Fastener installation apparatus. 5,181,315, Cl. 29-798.000.

Goodson, William E.: *See*—
Askew, James D.; Chao, Chin-Wang; Cochran, David R.; Dollard, Peter M.; Eslambolchi, Hossein; Goodson, William E.; Guenther, Robert P.; Mansour, Omar M.; Nguyen, Liem T.; and Tanuku, Sarma S., 5,182,744, Cl. 370-16.000.

Goodyear Tire & Rubber Company, The: *See*—
Pollack, Richard S.; Phelan, John R.; Ames, Ronald M.; Starkey, Gene R.; Brown, Robert W.; Belski, Gary T.; and Dunn, William F., 5,181,975, Cl. 152-152.100.

Gordon, Jeffrey S.: *See*—
Farrell, Joseph K.; Gordon, Jeffrey S.; Kuhl, Daniel C.; and Lee, Timothy V., 5,182,800, Cl. 395-425.000.

Gordon, Robert L.: *See*—
Quick, James R.; and Gordon, Robert L., 5,181,610, Cl. 206-447.000.

Gorgen, William E.: *See*—
Widnall, Sheila E.; Widnall, William S.; Gorgen, William E.; and Evernham, Jeffrey T., 5,181,678, Cl. 244-219.000.

Gosens, Johannes C.: *See*—
Claesen, Christianus A.; Lohmeijer, Johannus H. G. M.; Boogers, Michael P. J.; Bussink, Jan; Savenije, Hermannus B.; Hoeks, Theodorus L.; and Gosens, Johannes C., 5,182,325, Cl. 524-404.000.

Goss, Lloyd C.: *See*—
Weispfenning, Gerald L.; and Goss, Lloyd C., 5,182,682, Cl. 360-77.080.

Gosselink, Eugene P.: *See*—
Morrall, Stephen W.; Gosselink, Eugene P.; Pan, Robert Y.; and Nayar, Bala C., 5,182,043, Cl. 252-174.000.

Goto, Eiichi; Geng, Qiquan; and Yuyama, Junpei, to Research Development Corporation of Japan; and Yuyama, Junpei, a part interest. Refrigerator. 5,181,383, Cl. 62-6.000.

Goto, Kiyoshi: *See*—
Tomiyasu, Hiroshi; Kobayashi, Yoshiko; Goto, Kiyoshi; Yamamoto, Takeshi; and Nakai, Hideyuki, 5,182,183, Cl. 430-165.000.

Goto, Kuniaki, to Kabushiki Kaisha Toshiba. Pulse delay circuit having two comparators. 5,182,480, Cl. 307-608.000.

Goto, Takeshi, to Matsushita Electric Industrial Co., Ltd. Remote control system for audio/video devices. 5,182,551, Cl. 340-825.240.

Goto, Yoshiko: *See*—
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Gotoh, Yoshitaka; Kikuchi, Shigeru; Nakazawa, Tetsuo; Miyoshi, Tadahiko; Oyama, Tetsuo; Ozawa, Yoshihiro; and Itoh, Shin-ichi, to Hitachi, Ltd. Nuclear fusion reactor. 5,182,075, Cl. 376-150.000.

Gotou, Makoto: *See*—
Inaji, Toshio; and Gotou, Makoto, 5,182,499, Cl. 318-254.000.

Gounder, Ponnusami K., to Ahlstrom Pyropower Corporation. Power plant with dual pressure reheat system for process steam supply flexibility. 5,181,381, Cl. 60-648.000.

Gouttebarge, Jean C., to Etablissements Gouttebarge. Process for manufacturing cutting blades. 5,181,321, Cl. 30-357.000.

GPT Limited: *See*—
Robertson, Stuart C., 5,182,780, Cl. 385-14.000.

Gradecki, Raymond J.: *See*—
Kuhlman, Marvin G.; Finkiewicz, Daniel J.; and Gradecki, Raymond J., 5,181,464, Cl. 101-28.000.

Gratzl, Christa: *See*—
Lampert, Ingolf; and Gratzl, Christa, 5,181,985, Cl. 156-635.000.

Gray, Lewis; Garbarino, Joseph L.; Micol, John S.; Crenshaw, Johnny W.; Iacono, Vincent M.; Barley, James C.; Hollen, Richard L.; and Graziani, Terry M., to Westinghouse Electric Corp. Method for installing annular seals. 5,181,308, Cl. 29-436.000.

Gray, Roger M.: *See*—
Campbell, Kenneth C.; Gray, Roger M.; and Kockler, Barry C., 5,182,687, Cl. 360-92.000.

Graziani, Terry M.: *See*—
Gray, Lewis; Garbarino, Joseph L.; Micol, John S.; Crenshaw, Johnny W.; Iacono, Vincent M.; Barley, James C.; Hollen, Richard L.; and Graziani, Terry M., 5,181,308, Cl. 29-436.000.

Green, Gary L. Drum sander and fasteners. 5,181,347, Cl. 51-370.000.

Green, Kenneth. Emergency propulsion device. 5,181,872, Cl. 440-101.000.
Green, Richard M.: *See—*
Hussey, John P.; Green, Richard M.; and Keslowitz, Saul L., 5,181,823, Cl. 414-730.000.
Greenfield, Simon: *See—*
Coates, David; Sage, Ian C.; and Greenfield, Simon, 5,182,047, Cl. 252-299.660.
Greenlee, Mark L.: *See—*
DiNinno, Frank; Rano, Thomas A.; and Greenlee, Mark L., 5,182,384, Cl. 540-302.000.
Gregg, John. Dislodgement device. 5,181,303, Cl. 29-255.000.
Greig, Kevin M.: *See—*
Houston, Michelle L.; and Greig, Kevin M., 5,181,925, Cl. 623-20.000.
Gremelsbacker, John. Device for bundling sheet material. 5,181,460, Cl. 100-34.000.
Gretak Aktiengesellschaft: *See—*
Kipphan, Helmut; Loffler, Gerhard; Keller, Guido; and Ott, Hans, 5,182,721, Cl. 364-526.000.
Greve, Christopher: *See—*
Lapeyre, James M., deceased; Greve, Christopher; and O'Connor, Ronald M., 5,181,879, Cl. 452-160.000.
Griffith, David C., to High Voltage Maintenance. Neutral wire current monitoring for three-phase four-wire power distribution system. 5,182,547, Cl. 340-664.000.
Griffith, Walter L. Dental mirror. 5,181,848, Cl. 433-30.000.
Griggs, R. Lamar; and Hatton, Norman E., to Lockheed Corporation. Method and apparatus for automated drilling hole patterns in elongated workpieces. 5,181,808, Cl. 408-1.00R.
Grimwood, Geoffrey L., to Thomas Broadbent & Sons Limited. Centrifuge separating systems. 5,182,020, Cl. 210-512.100.
Grissinger, Glen S.: *See—*
Stankus, John C.; Stewart, Eugene H.; and Grissinger, Glen S., 5,181,800, Cl. 405-259.600.
Grochowski, Edwin T., to General Motors Corporation. Retainer for splined members. 5,181,792, Cl. 403-359.000.
Groen, Barend: *See—*
Geerlof, Arie; Groen, Barend; and Duine, Johannis A., 5,182,209, Cl. 435-280.000.
Grogan, R. P.: *See—*
Balderrama, Mark A.; and Grogan, R. P., 5,181,635, Cl. 222-383.000.
Grohe, Klaus, to Bayer Aktiengesellschaft. Preparation of 3-amino-2-(het)aroyl-acrylic acid derivatives. 5,182,401, Cl. 546-287.000.
Gronvald, Frederik C.: *See—*
Jorgensen, Anker S.; Stidsen, Carsten E.; Faarup, Peter; Gronvald, Frederik C.; and Nielsen, Flemming E., 5,182,279, Cl. 514-250.000.
Gross, Akiva: *See—*
Haralampu, Stephen G.; Sands, Stephen; and Gross, Akiva, 5,182,130, Cl. 427-3.000.
Gross, Anthony E.; and Passantino, Nancy L., to Nalco Chemical Company. Dust control and ore handling aid for bauxite ore. 5,181,957, Cl. 75-772.000.
Gross, Martin, to E.G.O. Elektro-Gerate Blanc u. Fischer. Method and apparatus for fixing heating resistors to a support. 5,181,312, Cl. 29-611.000.
Grosswiller, Leo J.; Theriault, F. Michael; Mannella, Lawrence F.; and Anders, Walter G., to Diebold, Incorporated. Pneumatic tube system. 5,181,805, Cl. 406-189.000.
Grosswiller, Leo J.; Theriault, F. Michael; Mannella, Lawrence F.; and Anders, Walter G., to Diebold, Incorporated. Pneumatic tube system. 5,181,806, Cl. 406-189.000.
Grosvenor, Victor L.: *See—*
Clough, Thomas J.; Grosvenor, Victor L.; and Pinsky, Naum, 5,182,165, Cl. 428-263.000.
Grot, Walther G., to Du Pont de Nemours, E. I., and Company. Applicator for applying sealant for electrochemical cell. 5,181,791, Cl. 401-266.000.
Grove, Corey M.: *See—*
Tardiff, Albert N., Jr.; and Grove, Corey M., 5,181,506, Cl. 128-201.220.
Gruber, Reinhold: *See—*
Pohl, Peter; and Gruber, Reinhold, 5,181,891, Cl. 475-162.000.
Grumman Aerospace Corporation: *See—*
Hussey, John P.; Green, Richard M.; and Keslowitz, Saul L., 5,181,823, Cl. 414-730.000.
Gruner, George: *See—*
Solomon, Rodney J.; Mason, Martin K.; Gruner, George; and Fearnside, James T., 5,181,514, Cl. 128-660.090.
Gschwend, Hans; and Buechel, Johann, to Hilti Aktiengesellschaft. Internal combustion powered device for setting fastening elements. 5,181,495, Cl. 123-46.0SC.
Gschwend, Norbert; and Koch, Rudolf, to Sulzer Medizinaltechnik AG. Patella prosthesis. 5,181,924, Cl. 623-20.000.
GTE Laboratories Incorporated: *See—*
Tabasky, Marvin; Cataldo, Victor; Fitzgerald, Thomas W.; Chirravuri, Jagannath; Armiento, Craig A.; and Haugsjaa, Paul O., 5,182,782, Cl. 385-89.000.
Gualtier, Quentin E.: *See—*
Dellanno, Ronald P.; and Gualtier, Quentin E., 5,181,763, Cl. 297-391.000.
Gubin, Jean; Chatelain, Pierre; Descamps, Marcel; Nisato, Dino; Inion, Henri; Lucchetti, Jean; Mahaux, Jean-Marie; and Vallat, Jean-Noel, to Sanofi. Pyrozala-pyridyl aminoabkoxyphenol compounds. 5,182,291, Cl. 514-300.000.
Gudat, Adam J.: *See—*
Kyrtsos, Christos T.; and Gudat, Adam J., 5,182,712, Cl. 364-424.070.
Guenther, Robert P.: *See—*
Askew, James D.; Chao, Chin-Wang; Cochran, David R.; Dollard, Peter M.; Eslambolchi, Hossein; Goodson, William E.; Guenther, Robert P.; Mansour, Omar M.; Nguyen, Liem T.; and Tanuku, Sarma S., 5,182,744, Cl. 370-16.000.
Guerra-Reyes, Maria T.: *See—*
Berrun-Castanon, Jorge D.; Guerra-Reyes, Maria T.; and Ruiz-Leal, Leopoldo I., 5,181,954, Cl. 75-433.000.
Guida, Renato: *See—*
Cole, Herbert S., Jr.; Rose, James W.; Guida, Renato; and Liu, Yung S., 5,182,188, Cl. 430-323.000.
Guilbert, Martine: *See—*
Bosc, Dominique; Guilbert, Martine; and Toinen, Christian, 5,182,783, Cl. 385-123.000.
Guillaume, Jacques: *See—*
Clemence, Francois; Guillaume, Jacques; and Hamon, Gilles, 5,182,282, Cl. 514-253.000.
Guillemin, Roger C. L.: *See—*
Ling, Nicholas C. K.; Ueno, Naoto; Shimasaki, Shunichi; Esch, Frederick S.; Ying, Shao-Yao; and Guillemin, Roger C. L., 5,182,375, Cl. 536-23.500.
Guilmette, Robert: *See—*
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.
Guinon, Yvan: *See—*
Gillard, John W.; Gauthier, Jacques-Yves; Evans, Jillian F.; Fortin, Rejean; Guinon, Yvan; Dixon, Richard A. F.; and Miller, Douglas K., 5,182,367, Cl. 530-350.000.
Gullans, Steven R.; and Heilig, Charles W., to Brigham and Women's Hospital. Treatment of osmotic disturbance with organic osmolytes. 5,182,299, Cl. 514-460.000.
Gunawardana, Geewananda P.; McCarthy, Peter J.; and Burres, Neal S., to Harbor Branch Oceanographic. Bioactive heterocycle alkaloids and methods of use. 5,182,287, Cl. 514-260.000.
Gundlach, Philip M., Jr.: *See—*
Beck, David C.; and Gundlach, Philip M., Jr., 5,182,720, Cl. 364-509.000.
Guse, Kuno: *See—*
Heintzmannn, Peter; and Guse, Kuno, 5,181,766, Cl. 299-34.000.
Gustavsen, Willard. Pivotable cart. 5,181,731, Cl. 280-47.131.
Guther, Reiner: *See—*
Florek, Stefan; Guther, Reiner; and Becker-Ross, Helmut, 5,182,609, Cl. 356-328.000.
Guttner, Arnold; Herrmann, Jobst; and Simon, Karl-H., to Carl-Zeiss-Stiftung. Method of making laser gyro resonator blocks. 5,181,306, Cl. 29-413.000.
Gyurovits, John S. Timing-range gear. 5,181,486, Cl. 123-90.170.
H. B. Fuller Licensing & Financing Inc.: *See—*
Sato, Norman J., 5,182,134, Cl. 427-543.000.
Ha, Byung J.: *See—*
Kim, Young D.; and Ha, Byung J., 5,182,373, Cl. 536-4.100.
Haberkorn, Robert W. Collapsible structure for unitizing and bracing a load in a trailer. 5,181,815, Cl. 410-140.000.
Hadgis, George A.: *See—*
Rudak, Peter; and Hadgis, George A., 5,182,778, Cl. 382-54.000.
Haeberli, Paul E., to Silicon Graphics, Inc. Method and apparatus for painting on a computer. 5,182,548, Cl. 340-706.000.
Haferl, Peter E., to RCA Thomson Licensing Corporation. Raster distortion avoidance arrangement. 5,182,504, Cl. 315-370.000.
Hager, Thomas P.; and Hendry, Janet A., to Owens-Corning Fiberglas Technology, Inc. Optical fiber or filament reinforcement coating. 5,182,784, Cl. 385-128.000.
Hagi, Norio; and Takeyama, Takahiro, to Tosoh Corporation. Process for producing carriers for immunoassay. 5,182,329, Cl. 525-242.000.
Hagmann, Karl, to Rhone-Poulenc Viscosuisse SA. Device for photoelectrically monitoring a moving yarn using two sensor heads. 5,182,457, Cl. 250-572.000.
Hahggi, Douglas A.: *See—*
Funkenbusch, Eric F.; Carr, Peter W.; Hahggi, Douglas A.; and Weber, Thomas P., 5,182,016, Cl. 210-198.200.
Hain, David A., to NCR Corporation. Apparatus for assessing the stiffness of a sheet. 5,182,722, Cl. 364-551.010.
Hain, Matthew E.: *See—*
Chesterfield, Michael P.; Koyfman, Ilya; and Hain, Matthew E., 5,181,923, Cl. 606-228.000.
Hall, Eric R. D.: *See—*
Harken, Olaf T.; Hall, Eric R. D.; and Kramers, S. Dirk, 5,181,477, Cl. 114-39.100.
Hall, Mark E.: *See—*
Lindley, John D.; Mackenzie, Colin R.; and Hall, Mark E., 5,181,564, Cl. 166-55.600.
Hall, William J.: *See—*
Carlos, Joseph M.; Carstensen, Thomas A.; Hall, William J.; and Osiecki, Larry J., 5,182,150, Cl. 428-35.700.

Hall, William T.: *See*—
Johnson, Eric A.; Schreiber, David; Ho, Kwok P.; Hall, William T.; Yang, Huei-hsiung; and Geldiay-Tuncer, Beril, 5,182,208, Cl. 435-254.000.

Hall, William W.; Read, Stanley E.; Lyons, Michael; and Zabriskie, John B., to Rockefeller University, The. Use of colchicine for the control of retroviruses. 5,182,306, Cl. 514-629.000.

Hallgrimsson, Bjarki H., to Leland Stanford Junior University, The Board of Trustees of the. Seismic shelf guard. 5,181,622, Cl. 211-183.000.

Halliburton Company: *See*—
McKown, Kenneth W.; and Rothenberger, Danny, 5,181,568, Cl. 166-293.000.

Halliburton Geophysical Services, Inc.: *See*—
Mayo, Frank, 5,182,558, Cl. 341-118.000.

Halliburton, Ronald, to Jeron Technology, Inc. Golf game apparatus. 5,181,721, Cl. 273-177.00A.

Hallinan, E. Ann; Husa, Robert K.; and Peterson, Karen B., to G. D. Searle & Co. 8-substituted-dibenz[b,f][1,4]oxazepine-10(11)-carboxylic acid, substituted hydrazides, pharmaceutical compositions, and methods for treating pain. 5,182,272, Cl. 514-80.000.

Hamaguchi, Hiromitsu: *See*—
Harafuji, Kenji; Misaka, Akio; Hamaguchi, Hiromitsu; and Kawakita, Kenji, 5,182,718, Cl. 364-490.000.

Hamatani, Fumikazu: *See*—
Nakano, Yuji; and Hamatani, Fumikazu, 5,182,768, Cl. 379-387.000.

Hamilton, Patrick J.: *See*—
Taylor, Stewart S.; McCormack, Gary D.; Davenport, William H.; and Hamilton, Patrick J., 5,182,467, Cl. 307-243.000.

Hammer Corporation, The: *See*—
Jones, Gary A., 5,181,896, Cl. 482-97.000.

Hammett, Roy. Non-reusable syringe. 5,181,912, Cl. 604-110.000.

Hamon, Gilles: *See*—
Clemence, Francois; Guillaume, Jacques; and Hamon, Gilles, 5,182,282, Cl. 514-253.000.

Hanai, Tetsuya: *See*—
Mishima, Ken; Mimura, Akio; Takahara, Yoshimasa; Asami, Kouji; and Hanai, Tetsuya, 5,182,193, Cl. 435-29.000.

Hand, David W.: *See*—
Crittenden, John C.; Notthakun, Sawang; Hand, David W.; and Perram, David L., 5,182,030, Cl. 210-748.000.

Handa, Kiyoji; Mukaeda, Satoshi; Kanai, Hideyuki; Yamashita, Yohachi; Furukawa, Osamu; and Harata, Mitsuo, to Marcon Electronics Co., Ltde.; and Kabushiki Kaisha Toshiba. Ceramic composition and electronic part using the same. 5,182,695, Cl. 361-321.000.

Handa, Tomohisa: *See*—
Hirose, Ichiro; Handa, Tomohisa; Iwata, Noriyuki; and Choshi, Masahiro, 5,181,485, Cl. 123-90.170.

Handschy, Mark A.: *See*—
O'Callaghan, Michael J.; and Handschy, Mark A., 5,182,665, Cl. 359-95.000.

Handy, Debra C.: *See*—
Powers, Kenneth W.; Wang, Hsien-Chang; Handy, Debra C.; and Fusco, James V., 5,182,333, Cl. 525-315.000.

Haneda, Satoshi: *See*—
Fukuchi, Masakazu; Morita, Shizuo; Haneda, Satoshi; Satoh, Hisao; and Ikeda, Tadayoshi, 5,182,595, Cl. 355-200.000.

Haney, Donald E. Sander with orbiting platen and abrasive. 5,181,342, Cl. 51-60.000.

Hanna, John E.; and Abdi, Behrooz, to Motorola, Inc. Offset cancellation circuit and method of reducing pulse pairing. 5,182,476, Cl. 307-491.000.

Hannah, Marcia G.; Mehrer, George W.; Noone, Michael J.; Stahl, Kermit E.; and Quaranta, Joseph, to CertainTeed Corporation. Multilayer shingle. 5,181,361, Cl. 52-535.000.

Hanou, Frank: *See*—
Cunningham, Brian; and Hanou, Frank, 5,182,706, Cl. 364-406.000.

Hansen, Guenter: *See*—
Derber, Bernd; Hansen, Guenter; Reichelt, Helmut; Vamvakaris, Christos; and Zeidler, Georg, 5,182,372, Cl. 534-857.000.

Hansen, Jens: *See*—
Hedegaard, Kurt; Albrectsen, Sten; and Hansen, Jens, 5,182,081, Cl. 422-56.000.

Hanson, Derald F.: *See*—
Sherman, Randy J.; Weilbach, August O.; Hanson, Derald F.; and Smith, C. Dwight, 5,181,783, Cl. 384-114.000.

Hanson, Jay L.; and Jurewicz, Romuald M., to Thermo King Corporation. Methods and apparatus for monitoring the operation of a transport refrigeration system. 5,181,389, Cl. 62-126.000.

Hanssler, Gerd: *See*—
Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hanssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,182,286, Cl. 514-256.000.

Hara, Kazuyoshi: *See*—
Hara, Yoshinobu; Yuge, Shizuo; and Hara, Kazuyoshi, 5,182,598, Cl. 355-208.000.

Hara, Yoshinobu, to Minolta Camera Kabushiki Kaisha. Sheet guiding apparatus and an image forming apparatus using same. 5,182,534, Cl. 355-316.000.

Hara, Yoshinobu; Yuge, Shizuo; and Hara, Kazuyoshi, to Minolta Camera Kabushiki Kaisha. Control means for a transfer charger in an image forming apparatus. 5,182,598, Cl. 355-208.000.

Harada, Keizo: *See*—
Itozaki, Hideo; Hattori, Hisao; Harada, Keizo; and Higaki, Kenjiro, 5,182,256, Cl. 505-1.000.

Harada, Koichi: *See*—
Iizuka, Tetsuya; Yonemoto, Kazuya; Wada, Kazushi; Nakamura, Satoshi; and Harada, Koichi, 5,182,622, Cl. 257-231.000.

Harada, Koukichi: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.

Harada, Tetsuzo: *See*—
Matsui, Shigetomo; Uenishi, Masahiro; Iuchi, Sadao; Sugimoto, Kouji; Itoga, Kouyu; Harada, Tetsuzo; Michiba, Kouji; Onda, Katsuhiro; and Okumura, Takaaki, 5,182,775, Cl. 382-8.000.

Harafuji, Kenji; Misaka, Akio; Hamaguchi, Hiromitsu; and Kawakita, Kenji, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for writing a pattern on a semiconductor sample based on a resist pattern corrected for proximity effects resulting from direct exposure of the sample by a charged-particle beam or light. 5,182,718, Cl. 364-490.000.

Haraguchi, Shousuke: *See*—
Kaihara, Shoji; and Haraguchi, Shousuke, 5,182,590, Cl. 354-106.000.

Haralampu, Stephen G.; Sands, Stephen; and Gross, Akiva, to Opta Food Ingredients, Inc. Method for producing an edible prolamine coating from an aqueous latex. 5,182,130, Cl. 427-3.000.

Harata, Mitsuo: *See*—
Handa, Kiyoji; Mukaeda, Satoshi; Kanai, Hideyuki; Yamashita, Yohachi; Furukawa, Osamu; and Harata, Mitsuo, 5,182,695, Cl. 361-321.000.

Harbor Branch Oceanographic: *See*—
Gunawardana, Geewananda P.; McCarthy, Peter J.; and Burres, Neal S., 5,182,287, Cl. 514-260.000.

Hardesty, Terry D.: *See*—
Hutchison, Wayne R.; Patterson, Jon M.; Hardesty, Terry D.; Teal, Richard D.; Hayes, Eugene G.; Coffey, Michael J.; and Moore, Earl T., 5,181,688, Cl. 248-680.000.

Harita, Yasuhiro: *See*—
Sato, Toshihiro; Kiyama, Masaaki; Harita, Yasuhiro; and Ozone, Osamu, 5,181,838, Cl. 417-360.000.

Harken, Inc.: *See*—
Harken, Olaf T.; Hall, Eric R. D.; and Kramers, S. Dirk, 5,181,477, Cl. 114-39.100.

Harken, Olaf T.; Hall, Eric R. D.; and Kramers, S. Dirk, to Harken, Inc. Boom for sailing vessel. 5,181,477, Cl. 114-39.100.

Harlow, Richard A.: *See*—
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.

Harmann, Jonathan: *See*—
Peschmann, Kristian R.; and Harmann, Jonathan, 5,182,764, Cl. 378-57.000.

Harrington, James T., Jr. Foam sandwich enclosure with interlocking integral frame. 5,181,353, Cl. 52-79.100.

Hart, George M.; and Hayford, Mark E., to Wacker Silicones Corporation. Method for forming a transparent coating on rubber articles. 5,182,142, Cl. 427-393.500.

Hart, Milburn L., to Commercial Resins Company. Liquid spray machine for coating interior of pipes. 5,181,962, Cl. 118-306.000.

Hartley, Brian S. Thermophilic ethanol production in a two-stage closed system. 5,182,199, Cl. 435-162.000.

Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, to Canon Kabushiki Kaisha. Ink-jet having ink storing absorbant material. 5,182,579, Cl. 346-140.00R.

Hasegawa, Gary K. Bubble-forming toy sword. 5,181,875, Cl. 446-15.000.

Hasegawa, Shin; Oyama, Hajime; Katoh, Eiichi; and Moriya, Masao, to Ricoh Company, Ltd. Toner end detecting method for an electrophotographic copier. 5,182,600, Cl. 355-246.000.

Hasenberg, Daniel M.: *See*—
Stricklen, Phil M.; Hasenberg, Daniel M.; and Rooney, Patrick, 5,182,330, Cl. 525-247.000.

Hashida, Koichi; and Takata, Koji, to Sumitomo Electric Industries, Ltd. Flow control valve. 5,181,534, Cl. 137-501.000.

Hashimoto, Kenichi: *See*—
Taguchi, Kazuo; Onisawa, Kenichi; Fuyama, Moriaki; Tamura, Katsumi; Abe, Yoshio; Nakayama, Takahiro; Hashimoto, Kenichi; and Sato, Akira, 5,182,491, Cl. 313-503.000.

Hashimoto, Shigeo; and Sugiura, Yutaka, to C. Uyemura & Co., Ltd. Plating solution automatic control. 5,182,131, Cl. 427-8.000.

Hashimoto, Shinya: *See*—
Hirose, Kazunori; Hashimoto, Shinya; and Yajima, Koichi, 5,181,973, Cl. 148-302.000.

Hassig, Helmut: *See*—
Sitte, Hellmuth; Hassig, Helmut; Kunz, Armin; and Neumann, Klaus, 5,181,443, Cl. 83-72.000.

Hatanaka, Yuuji; Okamoto, Hiroo; Arai, Takao; Wakumura, Shin-ichi; Miyake, Ichiro; and Sakamoto, Shunichiro, to Hitachi Ltd.; and Pioneer Electric Corporation. PCM signal reproducing/recording apparatus. 5,182,678, Cl. 360-32.000.

Hatao, Masato: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Hatton, Norman E.: *See*—
Griggs, R. Lamar; and Hatton, Norman E., 5,181,808, Cl. 408-1.00R.

Hattori, Hisao: *See*—
Itozaki, Hideo; Hattori, Hisao; Harada, Keizo; and Higaki, Kenjiro, 5,182,256, Cl. 505-1.000.

Hauck, Dieter: *See*—
Rodi, Anton; Hauck, Dieter; May, Karl-Heinz; and Muller, Hans, 5,182,803, Cl. 395-575.000.

Haugsjaa, Paul O.: *See*—
Tabasky, Marvin; Cataldo, Victor; Fitzgerald, Thomas W.; Chirravuri, Jagannath; Armiento, Craig A.; and Haugsjaa, Paul O., 5,182,782, Cl. 385-89.000.

Haun, Edward C.: *See*—
Lomas, David A.; Haun, Edward C.; and Sechrist, Paul A., 5,182,085, Cl. 422-144.000.

Hawk, Gary W.; Hayes, Earl J.; Hunt, Alexander, III; and Ward, Bobby G., to AMP Incorporated. Diagnostic header assembly. 5,181,862, Cl. 439-595.000.

Hay, Allan S.; and Kim, Whan Gi. Polymers and copolymers of high glass transition temperature from hindered phenols. 5,182,358, Cl. 528-191.000.

Hayakawa, Masatoshi: *See*—
Katori, Kenji; Hayakawa, Masatoshi; Aso, Koichi; Hayashi, Kazuhiko; and Kajiwara, Kazuo, 5,182,690, Cl. 360-120.000.

Hayakawa, Yasuyuki: *See*—
Komatsubara, Michiro; Kurosawa, Mitsumasa; Hayakawa, Yasuyuki; Iida, Yoshiaki; and Sadayori, Toshio, 5,181,972, Cl. 148-111.000.

Hayasaki, Hiroyuki: *See*—
Nakashima, Hisaharu; Hayasaki, Hiroyuki; Suzuki, Masami; Saito, Yoshinori; and Matuyama, Hisasi, 5,182,635, Cl. 358-12.000.

Hayashi, Kazuhiko: *See*—
Katori, Kenji; Hayakawa, Masatoshi; Aso, Koichi; Hayashi, Kazuhiko; and Kajiwara, Kazuo, 5,182,690, Cl. 360-120.000.

Hayashi, Kenji: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.

Hayashi, Shigeki, to Shimadzu Corporation. Ion scattering spectrometer. 5,182,453, Cl. 250-309.000.

Hayashi, Toshihiro: *See*—
Edo, Hiroshi; Bannai, Takashige; Hayashi, Toshihiro; and Sugie, Masayuki, 5,182,123, Cl. 426-19.000.

Hayashi, Yasukazu: *See*—
Ieki, Atsushi; Hayashi, Yasukazu; and Matsui, Keiji, 5,182,613, Cl. 356-374.000.

Hayashida, Mikio: *See*—
Kise, Shoichi; Hayashida, Mikio; Ori, Aiichiro; Hiratsuka, Junzou; and Yamada, Hideaki, 5,182,198, Cl. 435-126.000.

Haydu, Juan; Paneccasio, Vincent, Jr.; and Cacciatore, Patricia A., to Enthone-OMI Inc. Zincate solutions for treatment of aluminum and aluminum alloys. 5,182,006, Cl. 205-213.000.

Hayek, James S., to Textron Inc. Support for mounting an implement engine and supporting its crankshaft. 5,181,372, Cl. 56-17.400.

Hayes, Earl J.: *See*—
Hawk, Gary W.; Hayes, Earl J.; Hunt, Alexander, III; and Ward, Bobby G., 5,181,862, Cl. 439-595.000.

Hayes, Earl J., Sr., to AMP Incorporated. Electrical connector with secondary locking. 5,181,865, Cl. 439-752.000.

Hayes, Eugene G.: *See*—
Hutchison, Wayne R.; Patterson, Jon M.; Hardesty, Terry D.; Teal, Richard D.; Hayes, Eugene G.; Coffey, Michael J.; and Moore, Earl T., 5,181,688, Cl. 248-680.000.

Hayford, Mark E.: *See*—
Hart, George M.; and Hayford, Mark E., 5,182,142, Cl. 427-393.500.

Head Sports, Inc.: *See*—
Stites, John T., III; and Austry, Jerome M., 5,181,720, Cl. 273-80.200.

Healthdyne, Inc.: *See*—
Cooper, Tommy G.; Smith, Ross E.; and Macha, Emil S., 5,182,707, Cl. 364-413.110.

Heaton, Keith P.; Hunt, Kenneth W.; and Boughton, Rutland S., to Mediscus Group Inc., The. Therapeutic turning bed. 5,181,288, Cl. 5-607.000.

Heckmann, Walter: *See*—
Horn, Peter; Heckmann, Walter; Ramsteiner, Falko; and Gerold, Friedrich, 5,182,354, Cl. 528-60.000.

Hedegaard, Kurt; Albrectsen, Sten; and Hansen, Jens, to Kabi Pharmacia AB. Product to be used in occlusive epicutaneous testing for the purpose of demonstrating contact allergy to formaldehyde. 5,182,081, Cl. 422-56.000.

Hedengren, Kristina H.: *See*—
Young, John D.; Hedengren, Kristina H.; and Hurley, Donna C., 5,182,513, Cl. 324-232.000.

Hedrick, Brian W., to Uop. Apparatus for separating a resin phase from a solvent solution containing a solvent, demetallized oil and a resin. 5,181,557, Cl. 165-113.000.

Heeren, Robert G.: *See*—
Burkett, Fred T.; Bronson, Jerome G.; and Heeren, Robert G., 5,182,564, Cl. 342-53.000.

Hefner, Robert E., Jr.; and Earls, Jimmy D., to Dow Chemical Company, The. Blends of mesogenic polythiiranes, epoxy resin and curing agent. 5,182,340, Cl. 525-525.000.

Hehl, Karl. Plasticizing apparatus for use in an injection molding machine. 5,182,118, Cl. 425-192.00R.

Heichler, Johannes, to ANT Nachrichtentechnik GmbH. Data transmission method and arrangement. 5,182,745, Cl. 370-85.100.

Heidelberger Druckmaschinen AG: *See*—
Merkel, Gerd; Vogt, Wilfried; Glaunsinger, Georg; Stadler, Peter; Zander, Claus-Peter; Maass, Jurgen; Schmitt, Gernot; Necker, Thomas; and Becker, Willi, 5,181,469, Cl. 101-415.100.
Rodi, Anton; Hauck, Dieter; May, Karl-Heinz; and Muller, Hans, 5,182,803, Cl. 395-575.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Kipphan, Helmut; Loffler, Gerhard; Keller, Guido; and Ott, Hans, 5,182,721, Cl. 364-526.000.

Heilig, Charles W.: *See*—
Gullans, Steven R.; and Heilig, Charles W., 5,182,299, Cl. 514-460.000.

Hein, Piet, to Piet Hein A/S. Sundial. 5,181,324, Cl. 33-270.000.

Heinonen, Aimo. Reflectometric method of measurement and apparatus for realizing the method. 5,182,618, Cl. 356-446.000.

Heintzmannn, Peter; and Guse, Kuno, to Bochumer Eisenhutte Heintzmann GmbH & Co. KG. System for cutting and conveying coal and the like. 5,181,766, Cl. 299-34.000.

Heinzmann, Klaus: *See*—
Kiener, Andreas; Glockler, Rainer; and Heinzmann, Klaus, 5,182,197, Cl. 435-122.000.

Hekman, Edward W.; and Hekman, Frederick A., to Autocam Corporation. Internally constrained vane compressor. 5,181,843, Cl. 418-1.000.

Hekman, Frederick A.: *See*—
Hekman, Edward W.; and Hekman, Frederick A., 5,181,843, Cl. 418-1.000.

Held, Bert J.: *See*—
Maria van Hout, Hendricus H.; Oyevaar, Martin H.; and Held, Bert J., 5,182,361, Cl. 528-371.000.

Helfer, Jeffrey L.: *See*—
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul M., 5,181,329, Cl. 34-156.000.

Hella KG Hueck & Co.: *See*—
Hussman, Micha, 5,182,460, Cl. 307-10.800.
Lange, Ulrich V.; Daub, Wolfgang; and Wendt, Friedrich-Karl, 5,182,432, Cl. 219-202.000.

Helms, Gregory L.; Horn, Wendy S.; Jones, E. Tracy T.; and Linemeyer, David L., to Merck & Co., Inc. Cholesterol lowering agents. 5,182,298, Cl. 514-455.000.

Henderson, Charles A.; and Henderson, Terry D. Oil vapor extraction system. 5,182,086, Cl. 422-171.000.

Henderson, Daniel E.; and Allen, William E., to Caterpillar Inc. Dual motor windshield wiper control system. 5,182,501, Cl. 318-443.000.

Henderson, Terry D.: *See*—
Henderson, Charles A.; and Henderson, Terry D., 5,182,086, Cl. 422-171.000.

Hendry, Janet A.: *See*—
Hager, Thomas P.; and Hendry, Janet A., 5,182,784, Cl. 385-128.000.

Hendzel, Adam J., to Tuthill Corporation. Tube testing connector. 5,181,543, Cl. 138-90.000.

Henkel Kommandigesellschaft auf Aktien: *See*—
Klueppel, Hans-Juregen; and Fabry, Bernd, 5,182,100, Cl. 424-49.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Bauer, Volker; Raehse, Wilfried; Koester, Klaus; and Jacobs, Jochen, 5,182,054, Cl. 264-15.000.
Wuelknitz, Peter; Lehmann, Rudolf; and Klueppel, Hans-Juergen, 5,182,101, Cl. 424-54.000.

Henny Penny Corporation: *See*—
Burkett, Doug; and Mercer, Gary L., 5,182,439, Cl. 219-412.000.

Hepworth, Walter: *See*—
Lewis, Terence; Bansal, Harjinder S.; Sundley, Raymond L.; Bartley, Michael R.; Hepworth, Walter; Gilman, David J.; Kay, Ian T.; and Collins, David J., 5,182,402, Cl. 548-204.000.

Her, Jern-Shong. Distributor for television sets. 5,182,696, Cl. 361-380.000.

Hergenrother, Paul M.: *See*—
Connell, John W.; Hergenrother, Paul M.; and Wolf, Peter, 5,182,356, Cl. 528-128.000.

Hermann C. Starck Berlin GmbH & Co.: *See*—
Krismer, Bruno E.; and Nietfeld, Georg, 5,181,938, Cl. 51-293.000.

Hermann Hemscheidt Maschinenfabrik GmbH & Co.: *See*—
Geuns, Guy; and Reinelt, Werner, 5,181,451, Cl. 91-170.0MP.

Herrmann, Jobst: *See*—
Guttner, Arnold; Herrmann, Jobst; and Simon, Karl-H., 5,181,306, Cl. 29-413.000.

Hervieux, Jean-Claude: *See*—
Le Faou, Jacques; and Hervieux, Jean-Claude, 5,182,190, Cl. 430-546.000.

Herzog, Jack L. Package for supporting an unbuckled strap-type wristwatch. 5,181,608, Cl. 206-301.000.

Hesse, Alexander: *See*—
Viebach, Thomas; Kreibich, Rainer; Nuber, Bernd; Pauker, Robert; and Hesse, Alexander, 5,181,512, Cl. 128-660.030.
Hessel, Joachim; Koch, Rolf; and Sturm, Wolfgang, to Hoechst Aktiengesellschaft. Sealing sleeve and its use. 5,181,746, Cl. 285-3.000.
Heule, Heinrich. Deburring tool with cutting blade. 5,181,810, Cl. 408-147.000.
Heumann Pharma GmbH & Co.: *See*—
Morsdorf, Peter; Engler, Heidrun; Schickaneder, Helmut; and Ahrens, Kurt-Henning, 5,182,294, Cl. 514-341.000.
Hewitt, Timothy. Adjustable protecting guard apparatus for a blade of a table saw. 5,181,447, Cl. 83-447.000.
Hewlett-Packard Company: *See*—
Solomon, Rodney J.; Mason, Martin K.; Gruner, George; and Fearnside, James T., 5,181,514, Cl. 128-660.090.
Heyco Stamped Products, Inc.: *See*—
Jerome, Michael E.; and Jerome, Thomas A., 5,181,866, Cl. 439-850.000.
Heyes, Peter J.; Leishman, Ian M.; and Pope, Kevin J., to CMB Foodcan plc. Method of manufacturing a wall ironed can. 5,181,409, Cl. 72-46.000.
Hibino, Sadayoshi; Sato, Tadayuki; and Mochizuki, Motoyasu, to Kabushiki Kaisha Toshiba. Squirrel-cage rotor with shaped-conductor harmonic reduction. 5,182,483, Cl. 310-211.000.
Hickey, Donald D., to State University of New York, The. Method and apparatus for the measurement of atrial pressure. 5,181,517, Cl. 128-673.000.
Hiebert, Steven D., to United States of America, Interior. Fish egg and larvae collection system. 5,181,479, Cl. 119-3.000.
Higuki, Kenjiro: *See*—
Itozaki, Hideo; Hattori, Hisao; Harada, Keizo; and Higaki, Kenjiro, 5,182,256, Cl. 505-1.000.
Higaki, Yoshikazu: *See*—
Okada, Tadao; Ikeno, Hajime; Ozeki, Yuji; Higaki, Yoshikazu; Matsubara, Koshi; and Nakamura, Kenichi, 5,182,349, Cl. 526-265.000.
High Voltage Maintenance: *See*—
Griffith, David C., 5,182,547, Cl. 340-664.000.
Highland Supply Corporation: *See*—
Weder, Donald E.; and Straeter, Joseph G., 5,181,339, Cl. 47-72.000.
Weder, Donald E., 5,181,364, Cl. 53-397.000.
Higuma, Masahiko: *See*—
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.
Hijikata, Kenji: *See*—
Kanaka, Keiichi; and Hijikata, Kenji, 5,182,359, Cl. 528-193.000.
Hikasa, Tadashi: *See*—
Igarashi, Toshio; Shinohara, Sueharu; Tatsumi, Masayuki; Hikasa, Tadashi; and Mendori, Hiroaki, 5,182,167, Cl. 428-318.600.
Hill, Alan M.; and Meeks, William R., to Lawrence Paper Company. Adjustable slotter wheel and sheet feeder retrofit apparatus for box blank making machines. 5,181,899, Cl. 493-34.000.
Hill, Russell J.; and Smith, P. A. Joel, to BOC Group, Inc., The. Electron beam gun for use in an electron beam evaporation source. 5,182,488, Cl. 313-446.000.
Hilti Aktiengesellschaft: *See*—
Gschwend, Hans; and Buechel, Johann, 5,181,495, Cl. 123-46.0SC.
HIMONT Incorporated: *See*—
Bertelli, Guido; Cicchetti, Osvaldo; Goberti, Paolo; and Locatelli, Renato, 5,182,321, Cl. 524-100.000.
Hinooka, Kiyonobu, to NEC Corporation. Input protection circuit for analog/digital converting semiconductor. 5,182,621, Cl. 257-546.000.
Hirai, Takami; and Yano, Shinsuke, to NGK Insulators, Ltd. Dielectric ceramic composition of BaO, TiO_2,Nd_2O_3, Sm_2O_3 and Al_2O_3. 5,182,240, Cl. 501-139.000.
Hiramatsu, Akinori; Okamoto, Futoshi; Kido, Hiroshi; Sako, Hiroyuki; Yamanaka, Yukio; and Yamada, Koji, to Matsushita Electric Works, Ltd. Inverter device. 5,182,702, Cl. 363-132.000.
Hirano, Hirofumi: *See*—
Kashimura, Makoto; Nakagomi, Hiroshi; Karita, Seiichiro; Fukuda, Tsuguhiro; Kimura, Tetsuo; Hirano, Hirofumi; and Kurata, Mitsuru, 5,182,581, Cl. 346-140.00R.
Hiraoka, Noriyoshi; and Suzuki, Toyoshi, to Sanshin Kogyo Kabushiki Kaisha. Suctioned air introducing system for the outboard motor. 5,181,871, Cl. 440-77.000.
Hirata, Eiji: *See*—
Tanaka, Nobuhiro; Tawara, Hirotoshi; and Hirata, Eiji, 5,181,818, Cl. 414-414.000.
Hiratani, Kazuhisa: *See*—
Kasuga, Kazuyuki; Hirose, Takuji; Takahashi, Toshikazu; and Hiratani, Kazuhisa, 5,182,398, Cl. 546-171.000.
Hiratsuka, Junzou: *See*—
Kise, Shoichi; Hayashida, Mikio; Ori, Aiichiro; Hiratsuka, Junzou; and Yamada, Hideaki, 5,182,198, Cl. 435-126.000.
Hirokawa, Kiyofumi; and Taniguchi, Hitofumi, to Tokuyama Soda Kabushiki Kaisha. Aluminum nitride granules and process for the preparation thereof. 5,182,239, Cl. 501-98.000.
Hirose, Ichiro; Handa, Tomohisa; Iwata, Noriyuki; and Choshi, Masahiro, to Mazda Motor Corporation. Valve driving mechanism for double overhead camshaft engine. 5,181,485, Cl. 123-90.170.
Hirose, Kazunori; Hashimoto, Shinya; and Yajima, Koichi, to TDK Corporation. Sintered permanent magnet. 5,181,973, Cl. 148-302.000.
Hirose, Takuji: *See*—
Kasuga, Kazuyuki; Hirose, Takuji; Takahashi, Toshikazu; and Hiratani, Kazuhisa, 5,182,398, Cl. 546-171.000.
Hirose, Tatsuya: *See*—
Mochikawa, Hiroshi; Hirose, Tatsuya; and Horiguchi, Taki, 5,182,701, Cl. 363-98.000.
Hirota, Isao, to Sony Corporation. Charge coupled device imager with horizontal charge transfer section in an imaging section. 5,182,648, Cl. 358-213.110.
Hirota, Katsuaki: *See*—
Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; Kato, Funiaki; and Hirota, Katsuaki, 5,182,636, Cl. 358-41.000.
Hirth, Thomas: *See*—
Thelen, Ulrich; and Hirth, Thomas, 5,182,517, Cl. 324-418.000.
Hitachi Cable Limited: *See*—
Shibata, Akiji; and Ando, Nobuo, 5,182,667, Cl. 359-124.000.
Hitachi Koki Co., Ltd.: *See*—
Nakazawa, Takashi; Ohshima, Minoru; Ishikawa, Masami; Ogawa, Tsukasa; Miyasaka, Tohru; and Umeda, Takao, 5,182,596, Cl. 355-203.000.
Yamada, Masato; Shirakawa, Junji; and Uno, Kazuo, 5,182,605, Cl. 355-274.000.
Hitachi, Ltd.: *See*—
Fukuda, Takuya; Ohue, Michio; and Sonobe, Tadasi, 5,182,495, Cl. 315-111.410.
Gotoh, Yoshitaka; Kikuchi, Shigeru; Nakazawa, Tetsuo; Miyoshi, Tadahiko; Oyama, Tetsuo; Ozawa, Yoshihiro; and Itoh, Shinichi, 5,182,075, Cl. 376-150.000.
Hatanaka, Yuuji; Okamoto, Hiroo; Arai, Takao; Wakumura, Shinichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 5,182,678, Cl. 360-32.000.
Hongo, Mikio; Mizukoshi, Katsuro; Sano, Shyuzo; Kamimura, Takashi; and Takahashi, Takahiko, 5,182,231, Cl. 437-173.000.
Itoh, Masaaki; Matsushima, Hiroaki; Kogure, Hiroshi; Shizuya, Mitsutaka; and Kobayashi, Chie, 5,181,392, Cl. 62-160.000.
Izawa, Katsuyoshi; Kobayashi, Ryoichi; and Ozawa, Masayuki, 5,182,628, Cl. 257-707.000.
Kuroda, Kenichi; and Matsuo, Akinori, 5,182,719, Cl. 364-490.000.
Miyashita, Akimi; Fujii, Mutsumasa; Kubosawa, Minoru; Torii, Keiichiro; Ooki, Nobuaki; Kogawa, Kiyonori; Kawaguchi, Masami; Murooka, Hideyasu; and Kyooi, Masayuki, 5,182,121, Cl. 425-338.000.
Mizokami, Takuya; and Arai, Shinichi, 5,182,740, Cl. 369-47.000.
Nakazawa, Takashi; Ohshima, Minoru; Ishikawa, Masami; Ogawa, Tsukasa; Miyasaka, Tohru; and Umeda, Takao, 5,182,596, Cl. 355-203.000.
Nishimura, Toshifumi, 5,182,679, Cl. 360-48.000.
Saho, Norihide; Nemoto, Takeo; and Saeki, Mitsuru, 5,181,385, Cl. 62-51.100.
Suzuki, Masato; Inaba, Hiromi; Takenaga, Hiroshi; Yamazaki, Masachika; Oonuma, Naoto; Nakamura, Kiyoshi; Sakai, Yoshio; Yoneda, Kenji; Nakata, Naofumi; and Kasai, Syoji, 5,182,776, Cl. 382-14.000.
Suzuki, Masayoshi; and Akamatsu, Masuo, 5,181,420, Cl. 73-204.150.
Taguchi, Kazuo; Onisawa, Kenichi; Fuyama, Moriaki; Tamura, Katsumi; Abe, Yoshio; Nakayama, Takahiro; Hashimoto, Kenichi; and Sato, Akira, 5,182,491, Cl. 313-503.000.
Hitachi Maxell, Ltd.: *See*—
Miyake, Akira; and Yamamoto, Yoshinori, 5,182,153, Cl. 428-64.000.
Hitachi Techno Engineering Co., Ltd.: *See*—
Miyashita, Akimi; Fujii, Mutsumasa; Kubosawa, Minoru; Torii, Keiichiro; Ooki, Nobuaki; Kogawa, Kiyonori; Kawaguchi, Masami; Murooka, Hideyasu; and Kyooi, Masayuki, 5,182,121, Cl. 425-338.000.
Hitachi VLSI Engineering Corp.: *See*—
Kuroda, Kenichi; and Matsuo, Akinori, 5,182,719, Cl. 364-490.000.
Hively, James W.: *See*—
Bechtel, Richard L.; Thomas, Mammen; and Hively, James W., 5,182,632, Cl. 257-713.000.
Hjertholm, Ole G., to Friele Trading A/S. Sealing system for abutting tube ends in a pipe conduit. 5,181,730, Cl. 277-167.500.
Ho, Kwok P.: *See*—
Johnson, Eric A.; Schreiber, David; Ho, Kwok P.; Hall, William T.; Yang, Huei-hsiung; and Geldiay-Tuncer, Beril, 5,182,208, Cl. 435-254.000.
Hoch, Carl B., III: *See*—
Karas, Christopher R.; and Hoch, Carl B., III, 5,182,772, Cl. 380-49.000.
Hodan, John A., to BASF Corporation. Finish applicator. 5,181,400, Cl. 68-200.000.
Hodan, John A., to BASF Corporation. Yarn coating applicator. 5,181,401, Cl. 68-200.000.
Hodgson, Henry A.: *See*—
Plost, Gerald N.; and Hodgson, Henry A., 5,182,556, Cl. 340-984.000.
Hodoshima, Takashi; and Katoh, Shunji, to Ricoh Company, Ltd. Image forming apparatus having toner handling units which are alternatively usable as a developing device or a cleaning device. 5,182,601, Cl. 355-270.000.
Hoechst Aktiengesellschaft: *See*—
Geissler, Ulrich; and Wiezer, Hartmut, 5,182,187, Cl. 430-271.000.
Hessel, Joachim; Koch, Rolf; and Sturm, Wolfgang, 5,181,746, Cl. 285-3.000.

Vaahs, Tilo; Peuckert, Marcellus; and Bruck, Martin, 5,182,411, Cl. 556-409.000.

Weber, Jurgen; Lappe, Peter; and Springer, Helmut, 5,182,400, Cl. 546-250.000.

Hoechst Celanese Corp.: *See*—

Chen, Paul, Sr.; Sullivan, Vincent; Dolce, Thomas; and Jaffe, Mike, 5,182,334, Cl. 525-397.000.

Wu, Chengjiu; Mooring, Anne; and Yardley, James T., 5,182,185, Cl. 430-165.000.

Hoechst-Roussel Pharmaceuticals Incorporated: *See*—

Schonafinger, Karl; and Ong, Helen H., 5,182,275, Cl. 514-222.800.

Hoeks, Theodorus L.: *See*—

Claesen, Christianus A.; Lohmeijer, Johannus H. G. M.; Boogers, Michael P. J.; Bussink, Jan; Savenije, Hermannus B.; Hoeks, Theodorus L.; and Gosens, Johannes C., 5,182,325, Cl. 524-404.000.

Hoelscher, Hans-Juergen; Kerk, Thomas; Tuennermann, Wilfried; and Winnacker, Helmut, to Preussag Aktiengesellschaft. Well bore data transmission apparatus. 5,182,731, Cl. 367-84.000.

Hoffmann, Bernd F. W.: *See*—

Schwiegk, Stefan; Mathauer, Klemens; Wegner, Gerhard; Hoffmann, Bernd F. W.; and Vogel, Albrecht, 5,182,005, Cl. 204-435.000.

Hoffmann-La Roche Inc.: *See*—

Bauer, Steven R.; Kudo, Akira; Melchers, Georg F.; and Sakaguchi, Nobuo, 5,182,205, Cl. 435-240.200.

Danho, Waleed; Tilley, Jefferson W.; Triscari, Joseph; and Wagner, Rolf, 5,182,263, Cl. 514-16.000.

Manos, M. Michele; Wright, Deann K.; and Ting, Yi, 5,182,377, Cl. 536-24.320.

Yiannikouros, George P.; and Manchand, Percy S., 5,182,393, Cl. 549-4.000.

Hofmann, Georg: *See*—

Botz, Jakob; Hofmann, Georg; and Weber, Adam, 5,182,422, Cl. 200-61.540.

Botz, Jakob; Hofmann, Georg; and Weber, Adam, 5,182,423, Cl. 200-61.540.

Hofstra, Joseph S.; Karaskiewicz, Ronald J.; and Fischer, Mark R., to Quality Air Systems, Inc. Smoker's booth. 5,181,883, Cl. 454-49.000.

Hogan, Patrick J.: *See*—

Dorscht, John P.; and Hogan, Patrick J., 5,181,663, Cl. 241-81.000.

Holden, John G.; and Shanks, Ian A., to Thorn EMI plc. Light sources. 5,182,490, Cl. 313-485.000.

Hollander, Milton B.; and Jacobs, David R., to Omega Engineering, Inc. Transformable carton. 5,181,650, Cl. 229-103.000.

Hollieck, Helmut, to Kernforschungszentrum Karlsruhe GmbH. Protective layer of hard material with homogeneous distribution of elements. 5,182,238, Cl. 501-91.000.

Hollen, Richard L.: *See*—

Gray, Lewis; Garbarino, Joseph L.; Micol, John S.; Crenshaw, Johnny W.; Iacono, Vincent M.; Barley, James C.; Hollen, Richard L.; and Graziani, Terry M., 5,181,308, Cl. 29-436.000.

Holloway, Bertram A. Gripper means for stretcher leveler apparatus. 5,181,411, Cl. 72-302.000.

Holmes-Farley, Stephen R.; and Yanyo, Lynn C., to Lord Corporation. Layered sol-gel coatings. 5,182,143, Cl. 427-409.000.

Holographix, Inc.: *See*—

Clay, Burton R.; and Rowe, David M., 5,182,659, Cl. 359-17.000.

Holz, Harold F.: *See*—

Allsop, Ivor J.; Holz, Harold F.; and Clausen, Eivind, 5,181,822, Cl. 414-462.000.

Home Care Industries, Inc.: *See*—

Bosses, Mark D.; and Milstein, Yuri, 5,181,946, Cl. 55-381.000.

Honda Giken Kogyo K.K.: *See*—

Ishii, Yukihisa; Oono, Yetsuya; and Inagawa, Shinichi, 5,182,507, Cl. 318-685.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—

Ashikawa, Noboru; Yaguchi, Bunsho; Yasuda, Toyoshi; Takano, Masami; Ohhashi, Akihito; Shimada, Hiroyuki; and Akioka, Masahiro, 5,181,893, Cl. 475-203.000.

Iwai, Noriyuki; Sasaki, Kimito; Yano, Masaru; Wakimoto, Fumiyoshi; Tokunaga, Wataru; and Shirakura, Masaru, 5,182,676, Cl. 359-841.000.

Izumi, Masahiro; Aoshima, Toshiharu; Ide, Yutaka; Terawaki, Ritsuko; and Hosoya, Hideaki, 5,181,491, Cl. 123-336.000.

Kitahama, Michihiro; and Miyazaki, Akira, 5,181,307, Cl. 29-434.000.

Honda, Masami: *See*—

Kobayashi, Takaichi; Shibasaki, Kazuka; Hosoi, Takashi; Honda, Masami; and Takahashi, Kazuyoshi, 5,182,698, Cl. 361-395.000.

Hondo, Fumiaki: *See*—

Umaki, Yasuhide; Tomita, Rokuro; Hondo, Fumiaki; and Okada, Shigeru, 5,181,961, Cl. 106-724.000.

Honeycutt, Travis W.; and Taylor, Robert L., Jr. Hot water soluble packaging materials. 5,181,966, Cl. 134-42.000.

Honeycutt, Travis W., to Isolyser Company, Inc. Method of disposal of hot water soluble utensils. 5,181,967, Cl. 134-42.000.

Honeywell Bull Italia S.p.A.: *See*—

Bagnoli, Carlo; Perrella, Guido; and Majo, Tommaso, 5,182,808, Cl. 395-725.000.

Honeywell Inc.: *See*—

Bielas, Michael S.; and El-Wailly, Tamim F., 5,182,611, Cl. 356-350.000.

Miller, Harry, 5,182,505, Cl. 318-565.000.

Stuhr, Leslie P., 5,182,498, Cl. 318-15.000.

Hongo, Mikio; Mizukoshi, Katsuro; Sano, Shyuzo; Kamimura, Takashi; and Takahashi, Takahiko, to Hitachi, Ltd. Method for modifying wiring of semiconductor device. 5,182,231, Cl. 437-173.000.

Honma, Kazuhiro; Watanabe, Kunio; Morita, Takeshi; and Nanao, Shingo, to Daiichi Denshi Kogyo Kabushiki Kaisha; and Japan Aviation Electronics Industry Limited. Electrical connector with rotatable locking ring. 5,181,860, Cl. 439-321.000.

Honshu Paper Co., Ltd.: *See*—

Nagai, Shigeki; Sato, Haruo; and Karube, Nagahisa, 5,181,959, Cl. 106-211.000.

Hooke, John: *See*—

Brizendine, J. David; and Hooke, John, 5,182,178, Cl. 429-160.000.

Hopkins, Donald B., to University of Calif., The Regents of the. Method and apparatus for stabilizing pulsed microwave amplifiers. 5,182,524, Cl. 330-149.000.

Hopson, Talmadge W. CRT method of and apparatus for illuminating photographic negatives to produce a hard copy. 5,182,594, Cl. 355-20.000.

Horiba, Ltd.: *See*—

Kohno, Takeshi, 5,182,004, Cl. 204-409.000.

Horie, Kiyoshi, to Kabushiki Kaisha CSK. System for reading optical recording medium using reference liners which are positioned perpendicular to data tracks. 5,182,737, Cl. 369-47.000.

Horigome, Hideo; and Arakawa, Junichi, to Canon Kabushiki Kaisha. Ink-jet having battery capacity detection. 5,182,583, Cl. 346-140.00R.

Horiguchi, Akihiro: *See*—

Shuto, Naoki; Ueno, Fumio; Goto, Yoshiko; Horiguchi, Akihiro; Kasori, Mitsuo; and Imai, Motomasa, 5,182,540, Cl. 338-223.000.

Horiguchi, Taki: *See*—

Mochikawa, Hiroshi; Hirose, Tatsuya; and Horiguchi, Taki, 5,182,701, Cl. 363-98.000.

Horita, Yoshiyuki; Ishii, Susumu; and Takizawa, Toshiaki, to Yoshida Kogyo K. K. Pull tab for slide fastener sliders. 5,181,298, Cl. 24-429.000.

Horn, Arthur. Stabilized high speed bi-wheeled vehicle. 5,181,740, Cl. 280-755.000.

Horn, Peter; Heckmann, Walter; Ramsteiner, Falko; and Gerold, Friedrich, to BASF Aktiengesellschaft. Transparent, compact polyurethane casting compositions that are sterilizable with superheated steam, process for preparing same, and their use, particularly for medical-technical articles. 5,182,354, Cl. 528-60.000.

Horn, Wendy S.: *See*—

Helms, Gregory L.; Horn, Wendy S.; Jones, E. Tracy T.; and Linemeyer, David L., 5,182,298, Cl. 514-455.000.

Horwat, David W.: *See*—

Iacoveillo, John G.; and Horwat, David W., 5,182,328, Cl. 524-803.000.

Hosoi, Takashi: *See*—

Kobayashi, Takaichi; Shibasaki, Kazuka; Hosoi, Takashi; Honda, Masami; and Takahashi, Kazuyoshi, 5,182,698, Cl. 361-395.000.

Hosoi, Toshiaki. Drill and drill grinding method and apparatus. 5,181,811, Cl. 408-230.000.

Hosomi, Hiroaki, to Seiko Epson Corporation. Thermal line printer having a rotatable head holding member. 5,181,787, Cl. 400-120.000.

Hosomi, Tatsuhide: *See*—

Asoh, Toshiaki; and Hosomi, Tatsuhide, 5,182,363, Cl. 528-499.000.

Hosoya, Hideaki: *See*—

Izumi, Masahiro; Aoshima, Toshiharu; Ide, Yutaka; Terawaki, Ritsuko; and Hosoya, Hideaki, 5,181,491, Cl. 123-336.000.

Hosoya, Koichi: *See*—

Tsuji, Toshinori; Hosoya, Koichi; Tsukimoto, Fumio; Ashida, Tatsuya; Okubo, Katsuyuki; Bokuhara, Tetsuo; and Shinzo, Toshiaki, 5,181,668, Cl. 242-54.00R.

Hotta, Hiroyuki: *See*—

Miyake, Hiroyuki; Abe, Tsutomu; Ito, Hisao; Hotta, Hiroyuki; Shimizu, Yasumoto; and Sakai, Yoshihiko, 5,182,625, Cl. 257-443.000.

Hottinger Baldwin Messtechnik GmbH: *See*—

Philipps, Michael; Schad, Hans-Dieter; and Viel, Wolfgang, 5,181,423, Cl. 73-724.000.

Hou, Jack, to Giftec, Ltd. Ornament assembly. 5,182,144, Cl. 428-16.000.

Houlihan, William J., to Sandoz Ltd. Thioether, keto-ester and alkyl phospholipids useful in treating multiple sclerosis. 5,182,271, Cl. 514-77.000.

House Food Industrial Co., Ltd.: *See*—

Yamamoto, Masanori; Nakayama, Toshio; Fujii, Osamu; and Okabe, Rie, 5,182,206, Cl. 435-253.300.

Houston, Michelle L.; and Greig, Kevin M., to Zimmer, Inc. Femoral component for a knee joint prosthesis having a modular cam and stem. 5,181,925, Cl. 623-20.000.

Howard, James W., to Digital Equipment Corporation. Split lens displaced long from each other along plane of cut. 5,182,444, Cl. 250-201.500.

Hoyrup, John: *See*—

Theys, Ezra; Taylor, Russell G.; Bertelsen, Bruce; Oey, Albert; Hoyrup, John; and Knafelc, Frank, 5,181,456, Cl. 99-485.000.

Hsiao, Cheng K.: *See*—

Mayo, James D.; Duff, James M.; Bluhm, Terry L.; and Hsiao, Cheng K., 5,182,382, Cl. 540-141.000.

Huang, Hung C. Zipper having anti-jam flaps. 5,181,299, Cl. 24-432.000.

Huang, Tsai-Sheng: *See*—

Yeh, Tse-Huei; Tsai, Song-Jau; Lin, Chang-Tsun; Liao, Long-Gee; and Huang, Tsai-Sheng, 5,181,408, Cl. 72-11.000.

Hubricht, Gerhard; Schunk, Bernd; Stollewerk, Reinfried; and Peters, Jorg, to Rheinmetall GmbH. Anti-tank missile system. 5,181,673, Cl. 244-3.120.

Hudgins, Richard D.; Sounart, Lawrence R.; and Storck, Alan G., to Thompson International, Inc. Lug nut retention for wheel cover. 5,181,767, Cl. 301-37.370.

Huebner, Verena D.; and Santi, Daniel V. Controlled synthesis of peptide mixtures using mixed resins. 5,182,366, Cl. 530-334.000.

Hufcor, Inc.: *See—*
Williams, Charles E., 5,181,296, Cl. 16-95.00R.

Hughes Aircraft Company: *See—*
Nash-Stevenson, Shelia K.; and Stockbridge, Dennis M., 5,182,789, Cl. 385-137.000.
Sokolich, Marko; and Bardai, Zaher, 5,181,874, Cl. 445-24.000.

Hughes, David: *See—*
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Hughes, John L., to Intevac, Inc. System for substrate cooling in an evacuated environment. 5,181,556, Cl. 165-80.100.

Hui, Henry K.; Divers, George A., III; and Soikowski, Carmen, to Puritan-Bennett Corporation. Method for bonding an analyte-sensitive dye compound to an addition-cure silicone. 5,182,353, Cl. 528-31.000.

Hujink, Hendrik W., to N.V. Nederlandsche Apparatenfabriek Nedap. Method and apparatus for producing admission tickets. 5,181,786, Cl. 400-61.000.

Hull, Charles W.: *See—*
Allison, Joseph W.; Richter, Jan; Childers, Craig M.; Smalley, Dennis R.; Hull, Charles W.; and Jacobs, Paul F., 5,182,055, Cl. 264-22.000.

Huls Troisdorf Aktiengesellschaft: *See—*
Ruff, Klaus; Falk, Bernhard; and Liesching, Detlef, 5,182,095, Cl. 423-659.000.

Hultholm, Stig-Erik: *See—*
Lilja, Launo L.; Makitalo, Valto J.; Hultholm, Stig-Erik; and Nyman, Bror G., 5,182,087, Cl. 422-228.000.

Hultman, Carl A.: *See—*
Najjar, Mitri S.; and Hultman, Carl A., 5,181,941, Cl. 55-16.000.

Hunt, Alexander, III: *See—*
Hawk, Gary W.; Hayes, Earl J.; Hunt, Alexander, III; and Ward, Bobby G., 5,181,862, Cl. 439-595.000.

Hunt, Kenneth W.: *See—*
Heaton, Keith P.; Hunt, Kenneth W.; and Boughton, Rutland S., 5,181,288, Cl. 5-607.000.

Hunter, Robert L.: *See—*
Mezrow, Craig K.; Hunter, Robert L.; and Bennett, Carol E., 5,182,106, Cl. 424-78.310.

Hurlbut, Amy O.; Riley, Glen M.; and Sinks, Rod G., to Intel Corporation. Transceiver interface. 5,182,746, Cl. 370-100.100.

Hurley, Donna C.: *See—*
Young, John D.; Hedengren, Kristina H.; and Hurley, Donna C., 5,182,513, Cl. 324-232.000.

Hurst, Jerry E., Jr.: *See—*
Donelon, John J.; Doyle, James P.; Hurst, Jerry E., Jr.; Opryszko, Modest M.; Rossnagel, Stephen M.; and von Gutfeld, Robert J., 5,182,230, Cl. 437-173.000.

Husa, Robert K.: *See—*
Hallinan, E. Ann; Husa, Robert K.; and Peterson, Karen B., 5,182,272, Cl. 514-80.000.

Huss, Rolf: *See—*
Braun, Dieter; Huss, Rolf; and Lampprecht, Alfred, 5,181,585, Cl. 184-7.400.

Hussey, John P.; Green, Richard M.; and Keslowitz, Saul L., to Grumman Aerospace Corporation. Apparatus and method for producing a video display. 5,181,823, Cl. 414-730.000.

Hussman, Micha, to Hella KG Hueck & Co. Method and apparatus to regulate illumination range of a motor vehicle. 5,182,460, Cl. 307-10.800.

Hutchinson, Alan J.: *See—*
Albaugh, Pamela; and Hutchinson, Alan J., 5,182,386, Cl. 540-350.000.

Hutchison, Wayne R.; Patterson, Jon M.; Hardesty, Terry D.; Teal, Richard D.; Hayes, Eugene G.; Coffey, Michael J.; and Moore, Earl T., to Deere & Company. Mechanism for coupling a component with a vehicle. 5,181,688, Cl. 248-680.000.

Hutzen, Hans W. Polyurethane foam material free of halogenated hydrocarbons and process for producing the same. 5,182,309, Cl. 521-99.000.

Hylsa S.A. de C.V.: *See—*
Berrun-Castanon, Jorge D.; Guerra-Reyes, Maria T.; and Ruiz-Leal, Leopoldo I., 5,181,954, Cl. 75-433.000.

Hymatic Engineering Company Limited, The: *See—*
Brown, Keith, 5,181,386, Cl. 62-51.200.

Hynecek, Jaroslav, to Texas Instruments Incorporated. Charge coupled device/charge super sweep image system and method for making. 5,182,623, Cl. 257-230.000.

Hyoi, Isao, to Murai Co., Ltd. Eyeglass frame having antirotation connection. 5,182,587, Cl. 351-124.000.

Hyundai Electronics Industries Co., Ltd.: *See—*
Kim, Jae W.; and Chung, In S., 5,182,224, Cl. 437-52.000.

I-Shou, Tasi. Computer with detachable printer mounting hardware. 5,182,697, Cl. 361-393.000.

Iacono, Vincent M.: *See—*
Gray, Lewis; Garbarino, Joseph L.; Micol, John S.; Crenshaw, Johnny W.; Iacono, Vincent M.; Barley, James C.; Hollen, Richard L.; and Graziani, Terry M., 5,181,308, Cl. 29-436.000.

Iacoveillo, John G.; and Horwat, David W., to Air Products and Chemicals, Inc. RF curable Type I wood adhesive composition comprising vinyl acetate/NMA copolymer emulsions containing tetramethylol glycoluril. 5,182,328, Cl. 524-803.000.

ICI Americas, Inc.: *See—*
Edens, William L., 5,182,119, Cl. 425-222.000.

Ida, Kanako: *See—*
Sagawa, Seiji; Kano, Toshio; Yachigo, Shinichi; and Ida, Kanako, 5,182,390, Cl. 544-222.000.

Ide, Yutaka: *See—*
Izumi, Masahiro; Aoshima, Toshiharu; Ide, Yutaka; Terawaki, Ritsuko; and Hosoya, Hideaki, 5,181,491, Cl. 123-336.000.

Idemitsu Kosan Co., Ltd.: *See—*
Kawabe, Yutaka, 5,182,666, Cl. 359-107.000.

Ieki, Atsushi; Hayashi, Yasukazu; and Matsui, Keiji, to Okuma Corporation. Position detecting apparatus generating periodic detection signals having equal third and fifth harmonic components. 5,182,613, Cl. 356-374.000.

Igata, Akitoshi: *See—*
Takuma, Keisuke; Ohyama, Tsukasa; Igata, Akitoshi; Mikoda, Tamio; Ghoda, Isamu; and Koshida, Hitoshi, 5,182,395, Cl. 552-251.000.

Ige, Hitoshi: *See—*
Yamamoto, Naoki; Mukai, Nobuhiro; Ige, Hitoshi; and Atarashi, Junko, 5,182,332, Cl. 525-305.000.

Igene Biotechnology, Inc.: *See—*
Johnson, Eric A.; Schreiber, David; Ho, Kwok P.; Hall, William T.; Yang, Huei-hsiung; and Geldiay-Tuncer, Beril, 5,182,208, Cl. 435-254.000.

Iida, Yoshiaki: *See—*
Komatsubara, Michiro; Kurosawa, Mitsumasa; Hayakawa, Yasuyuki; Iida, Yoshiaki; and Sadayori, Toshio, 5,181,972, Cl. 148-111.000.

Iizuka, Takashi; Watanabe, Yutaka; and Fukuda, Yasuaki, to Canon Kabushiki Kaisha. Reflection device. 5,182,763, Cl. 378-34.000.

Iizuka, Tetsuya; Yonemoto, Kazuya; Wada, Kazushi; Nakamura, Satoshi; and Harada, Koichi, to Sony Corporation. Charge coupled device imager having multichannel readout structure. 5,182,622, Cl. 257-231.000.

Ikeda Bussan Co., Ltd.: *See—*
Yanagishita, Norio, 5,181,980, Cl. 156-93.000.

Ikeda, Hayato; Fujii, Toshiro; Yokomachi, Naoya; and Takemoto, Shoji, to Kabushiki Kaisha Toyoda Jidoshokii Seisakusho. Swash plate type compressor. 5,181,834, Cl. 417-269.000.

Ikeda, Hiroshi: *See—*
Tanaka, Tetsukazu; Imai, Masahiro; Ikeda, Hiroshi; and Makino, Yosiyuki, 5,181,398, Cl. 68-12.060.

Ikeda, Kazue; and Ujita, Toshihiko, to Canon Kabushiki Kaisha. Ink jet recording apparatus with abnormal state detection. 5,182,580, Cl. 346-140.00R.

Ikeda, Masaki: *See—*
Mizuno, Yasuo; Ikeda, Masaki; and Yoshida, Akihiko, 5,181,947, Cl. 65-2.000.

Ikeda, Masami: *See—*
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.

Ikeda, Naoyasu; and Nakamura, Ken-ichi, to NEC Corporation. Thin film field effect transistor array for use in active matrix liquid crystal display. 5,182,661, Cl. 359-54.000.

Ikeda, Tadayoshi: *See—*
Fukuchi, Masakazu; Morita, Shizuo; Haneda, Satoshi; Satoh, Hisao; and Ikeda, Tadayoshi, 5,182,595, Cl. 355-200.000.

Ikeno, Hajime: *See—*
Okada, Tadao; Ikeno, Hajime; Ozeki, Yuji; Higaki, Yoshikazu; Matsubara, Koshi; and Nakamura, Kenichi, 5,182,349, Cl. 526-265.000.

Ikuta, Hironori: *See—*
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.

Ilatron Ltd.: *See—*
Zuta, Marc, 5,182,528, Cl. 331-1.00A.

Illinois Tool Works Inc.: *See—*
Van Allman, Don T.; and Corbin, Amos, 5,181,886, Cl. 470-40.000.

Imai, Masahiro: *See—*
Tanaka, Tetsukazu; Imai, Masahiro; Ikeda, Hiroshi; and Makino, Yosiyuki, 5,181,398, Cl. 68-12.060.

Imai, Motomasa: *See—*
Shuto, Naoki; Ueno, Fumio; Goto, Yoshiko; Horiguchi, Akihiro; Kasori, Mitsuo; and Imai, Motomasa, 5,182,540, Cl. 338-223.000.

Imamori, Katsumi: *See*—
Kurazumi, Toshiaki; Mizuno, Hireyuki; Imamori, Katsumi; and Iwasa, Akira, 5,182,112, Cl. 424-439.000.

Imanaka, Koichi: *See*—
Sekii, Hiroshi; and Imanaka, Koichi, 5,182,228, Cl. 437-129.000.

Imhof, Otwin: *See*—
Kistrup, Holger; and Imhof, Otwin, 5,182,241, Cl. 502-24.000.

Immega, Guy, to Kinetic Sciences Inc. Bellows actuator. 5,181,452, Cl. 91-418.000.

Imperial Chemical Industries PLC: *See*—
Lewis, Terence; Bansal, Harjinder S.; Sundley, Raymond L.; Bartley, Michael R.; Hepworth, Walter; Gilman, David J.; Kay, Ian T.; and Collins, David J., 5,182,402, Cl. 548-204.000.
Richardson, John, 5,182,068, Cl. 264-210.800.

Inaba, Hiromi: *See*—
Suzuki, Masato; Inaba, Hiromi; Takenaga, Hiroshi; Yamazaki, Masachika; Oonuma, Naoto; Nakamura, Kiyoshi; Sakai, Yoshio; Yoneda, Kenji; Nakata, Naofumi; and Kasai, Syoji, 5,182,776, Cl. 382-14.000.

Inagaki, Yoshio; Adachi, Keiichi; and Yabe, Masao, to Fuji Photo Film Co., Ltd. Optical information recording medium. 5,182,186, Cl. 430-270.000.

Inagawa, Shinichi: *See*—
Ishii, Yukihisa; Oono, Yetsuya; and Inagawa, Shinichi, 5,182,507, Cl. 318-685.000.

Inaji, Toshio; and Gotou, Makoto, to Matsushita Electric Industrial Co., Ltd. Sensorless brushless motor. 5,182,499, Cl. 318-254.000.

Inamex de Cerveza y Malta, S.A. de C.V.: *See*—
Becker, Karl L.; and Beldevere, Francesco, 5,181,454, Cl. 99-277.200.

Indelicato, Joseph A., to Kiley, Luanne; and Newman, John R., part interest to each. Tool holder. 5,181,682, Cl. 248-210.000.

Industrial Technology Research Institute: *See*—
Chen, Hsing; Koo, Horng-Show; Chang, Li; and Shieh, K. L., 5,181,528, Cl. 131-256.000.

Inertia Dynamics Corporation: *See*—
Everts, Robert G., 5,181,369, Cl. 56-12.700.

Ingram, James R., Jr.: *See*—
Norman, Thomas J., Jr.; Ingram, James R., Jr.; and Lin, Joel Y., 5,181,788, Cl. 400-232.000.

Inion, Henri: *See*—
Gubin, Jean; Chatelain, Pierre; Descamps, Marcel; Nisato, Dino; Inion, Henri; Lucchetti, Jean; Mahaux, Jean-Marie; and Vallat, Jean-Noel, 5,182,291, Cl. 514-300.000.

Innovative Closures, Inc.: *See*—
Thompson, Mortimer S., 5,181,615, Cl. 220-618.000.

Inoue, Akihiko: *See*—
Nagamune, Akio; Tezuka, Kouichi; Komine, Isamu; Kuriyama, Shinji; Komatani, Masaki; and Inoue, Akihiko, 5,182,565, Cl. 342-124.000.

Inoue, Hiroshi: *See*—
Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, 5,182,549, Cl. 340-784.000.

Inoue, Kazuhiko, to Kabushiki Kaisha Toshiba. Compound semiconductor pellet, and method for dicing compound semiconductor wafer. 5,182,233, Cl. 437-226.000.

Inoue, Masahiro: *See*—
Koshikawa, Nobuo; and Inoue, Masahiro, 5,181,545, Cl. 140-92.100.

Inoue, Naoshi; Yoshida, Shigeo; and Sugino, Toshio, to Canon Kabushiki Kaisha. Information processing apparatus capable of connecting printer. 5,182,650, Cl. 358-296.000.

Institut Francais du Petrole, Total Compagnie Francaise des Petroles, Compagnie Generald de Geophysique, Service National Dit: Gaz de France, Societe Nationale Elf Aquitaine (Production): *See*—
Czernichow, Jean, 5,181,565, Cl. 166-66.000.

Institut Pasteur: *See*—
Girard, Marc; Wychowski, Czeslaw; and Martin, Annette, 5,182,211, Cl. 435-320.100.

Integrated Device Technology, Inc.: *See*—
Lien, Chuen-Der, 5,182,475, Cl. 307-475.000.

Intel Corporation: *See*—
Hurlbut, Amy O.; Riley, Glen M.; and Sinks, Rod G., 5,182,746, Cl. 370-100.100.

International Business Machines Corporation: *See*—
Abraham, Robert L.; Moore, Richard E.; Rich, William L.; Shackelford, Floyd W.; Tiller, John R., Jr.; and Briggs, Richard S., Jr., 5,182,804, Cl. 395-600.000.
Bahl, Lalit R.; Picheny, Michael A.; Nahamoo, David; and de Souza, Peter V., 5,182,773, Cl. 381-41.000.
Begun, Ralph M.; Bland, Patrick M.; and Milling, Philip E., 5,182,809, Cl. 395-725.000.
Chevion, Dan S.; Karnin, Ehud D.; and Walach, Eugeniusz, 5,182,656, Cl. 358-452.000.
Donelon, John J.; Doyle, James P.; Hurst, Jerry E., Jr.; Oprysko, Modest M.; Rossnagel, Stephen M.; and von Gutfeld, Robert J., 5,182,230, Cl. 437-173.000.
Erb, Allen J., 5,182,029, Cl. 210-724.000.
Erdelyi, Charles K.; Marshall, Mark G.; Mathews, John W.; and Perry, Patrick E., 5,182,468, Cl. 307-296.100.
Farrell, Joseph K.; Gordon, Jeffrey S.; Kuhl, Daniel C.; and Lee, Timothy V., 5,182,800, Cl. 395-425.000.
Fitzgibbons, Patrick J.; Lee, Ho C.; Stone, Lawrence A.; and Van Note, Paul C., 5,181,465, Cl. 101-103.000.
Frenzel, James F., III; and Youngman, Brian A., 5,182,747, Cl. 370-85.500.
Kaiser, John M.; and St. Clair, Joe C., 5,182,554, Cl. 340-826.000.
Liang, Bob C.-C.; Liang, Nina Y.; Phelps, Michael J.; and Tannenbaum, David C., 5,182,797, Cl. 395-160.000.
Meyerson, Bernard S., 5,181,964, Cl. 118-719.000.
Thomas, Vincent P.; and Baker, Peter, 5,182,684, Cl. 360-78.090.
Van Brunt, Karl B., Jr.; and Petrozello, James R., 5,181,853, Cl. 439-67.000.

International Paper Company: *See*—
Bassett, John D., 5,181,444, Cl. 83-154.000.
Martin, James E.; and Robison, Richard G., 5,181,424, Cl. 73-835.000.
Oppenheim, Paul J., 5,181,651, Cl. 229-121.000.
Quick, James R.; and Gordon, Robert L., 5,181,610, Cl. 206-447.000.

Intevac, Inc.: *See*—
Hughes, John L., 5,181,556, Cl. 165-80.100.

Invision Technologies, Inc.: *See*—
Peschmann, Kristian R.; and Harmann, Jonathan, 5,182,764, Cl. 378-57.000.

Iolab Corporation: *See*—
Musson, Donald G.; and Olejnik, Orest, 5,182,270, Cl. 514-58.000.

Iowa State University Research Foundation, Inc.: *See*—
Chriswell, Colin D., 5,181,428, Cl. 73-863.120.

Ippendorf, Ralph. Filtrate separating device with flexible deformable liquid and gas impermeable wall. 5,182,017, Cl. 210-225.000.

Ireco, Inc.: *See*—
Rontey, Daniel C.; Bigando, Donald; and Wolfeil, Frank, 5,182,417, Cl. 102-204.000.

Irizato, Yoshihiro: *See*—
Takuma, Keisuke; Irizato, Yoshihiro; and Katho, Kimitoshi, 5,182,409, Cl. 556-146.000.

Irrgang, Michael E.: *See*—
Alexander, Rhonda L.; Irrgang, Michael E.; and Kirchner, John A., 5,182,793, Cl. 395-13.000.

Irstam, Lars: *See*—
Brodefors, Lage; and Irstam, Lars, 5,181,532, Cl. 137-14.000.

Isaac, J. Wayne, to Aerosol Disposal Systems, Inc. Disposal compactor for aerosol cans. 5,181,462, Cl. 100-98.00R.

Ishii, Katsumi: *See*—
Sakata, Kazunari; Ishii, Katsumi; and Yamaga, Kenichi, 5,181,819, Cl. 414-217.000.

Ishii, Susumu: *See*—
Horita, Yoshiyuki; Ishii, Susumu; and Takizawa, Toshiaki, 5,181,298, Cl. 24-429.000.

Ishii, Takaaki; and Kuge, Toru, to Kabushiki Kaisha Toshiba. Speech recognition system with an accurate recognition function. 5,182,765, Cl. 379-88.000.

Ishii, Yukihisa; Oono, Yetsuya; and Inagawa, Shinichi, to Honda Giken Kogyo K.K. Stepping motor driving circuit having failsafe function. 5,182,507, Cl. 318-685.000.

Ishikawa, Katsuhiro: *See*—
Ono, Hisao; Ito, Katsumi; Uekawa, Tatuo; and Ishikawa, Katsuhiro, 5,182,343, Cl. 526-240.000.

Ishikawa, Katsukiyo: *See*—
Matsumura, Akira; and Ishikawa, Katsukiyo, 5,181,984, Cl. 156-630.000.

Ishikawa, Masami: *See*—
Nakazawa, Takashi; Ohshima, Minoru; Ishikawa, Masami; Ogawa, Tsukasa; Miyasaka, Tohru; and Umeda, Takao, 5,182,596, Cl. 355-203.000.

Ishikawa, Takatoshi: *See*—
Kato, Masakazu; Ishikawa, Takatoshi; and Ishikawa, Tetsuo, 5,182,574, Cl. 346-76.0PH.

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Ishinaga, Hiroyuki; Saito, Asao; and Mori, Toshihiro, to Canon Kabushiki Kaisha. Ink jet recording head having an improved substance arrangement device. 5,182,577, Cl. 346-140.00R.

Ishitsuka, Fuminori: *See*—
Tomimuro, Hisashi; Ishitsuka, Fuminori; Sato, Nobuo; and Osaki, Takaaki, 5,182,631, Cl. 257-664.000.

Ishizaki, Akira; Suzuki, Kenji; Ohtaka, Keiji; and Suda, Yasuo, to Canon Kabushiki Kaisha. Image pickup apparatus for controlling accumulation time in photoelectric elements. 5,182,658, Cl. 358-483.000.

Ishizu, Nobuhiko: *See*—
Watanabe, Sumio; and Ishizu, Nobuhiko, 5,181,900, Cl. 493-210.000.

Ishizuka, Hitoharu; and Kubo, Reiko, to Nippon Petrochemicals Company, Limited. Method for producing fiber reinforced plastic rods having helical ribs. 5,182,064, Cl. 264-137.000.

Isolyser Company, Inc.: *See*—
Honeycutt, Travis W., 5,181,967, Cl. 134-42.000.

Isozaki, Tsuyoshi: *See*—
Tanisake, Hiroka; Koyama, Takeshi; and Isozaki, Tsuyoshi, 5,182,392, Cl. 548-520.000.

ISP Investments Inc.: *See*—
Kopolow, Stephen L.; Tazi, Mohammed; and Walls, Edward W., Jr., 5,182,098, Cl. 424-47.000.
Russell, Gary S., 5,182,323, Cl. 524-322.000.

Istituto Guido Donegani S.p.A.: *See*—
Caldwell, J. Brian; Banash, Mark A.; Che, Tessie M.; Mininni, Robert M.; and Warden, Victor N., 5,182,236, Cl. 521-12.000.

Ito, Eiichi: *See*—
Jutamulia, Suganda; Fujita, Akihiro; Toyoda, Shinji; Kojima, Atsushi; and Ito, Eiichi, 5,182,639, Cl. 358-81.000.
Ito, Hisao: *See*—
Miyake, Hiroyuki; Abe, Tsutomu; Ito, Hisao; Hotta, Hiroyuki; Shimizu, Yasumoto; and Sakai, Yoshihiko, 5,182,625, Cl. 257-443.000.
Ito, Katsumi: *See*—
Ono, Hisao; Ito, Katsumi; Uekawa, Tatuo; and Ishikawa, Katsuhiro, 5,182,343, Cl. 526-240.000.
Ito, Tatsuo: *See*—
Ozaki, Masahide; Uji, Masanori; Yamazaki, Makoto; and Ito, Tatsuo, 5,181,305, Cl. 29-408.000.
Ito, Tatuya: *See*—
Yamagishi, Toshio; Kimura, Youichi; Shuto, Tamotsu; and Ito, Tatuya, 5,181,714, Cl. 271-186.000.
Ito, Yasuo: *See*—
Sakata, Shigekazu; Ito, Yasuo; Ochiai, Kunio; and Yamagata, Hisao, 5,182,748, Cl. 370-94.100.
Itoga, Kouyu: *See*—
Matsui, Shigetomo; Uenishi, Masahiro; Iuchi, Sadao; Sugimoto, Kouji; Itoga, Kouyu; Harada, Tetsuzo; Michiba, Kouji; Onda, Katsuhiro; and Okumura, Takaaki, 5,182,775, Cl. 382-8.000.
Itoh, Akira; Okamura, Kazuyoshi; and Uchida, Kazuiki, to Toshiba Lighting & Technology Corporation. Ceramic electric-discharge lamp incorporating arc tube having at least two curved regions. 5,182,486, Cl. 313-25.000.
Itoh, Masaaki; Matsushima, Hiroaki; Kogure, Hiroshi; Shizuya, Mitsutaka; and Kobayashi, Chie, to Hitachi Ltd. Air conditioner and heat exchanger used therein. 5,181,392, Cl. 62-160.000.
Itoh, Masami: *See*—
Kikuchi, Shuichi; and Itoh, Masami, 5,182,673, Cl. 359-691.000.
Itoh, Shin-ichi: *See*—
Gotoh, Yoshitaka; Kikuchi, Shigeru; Nakazawa, Tetsuo; Miyoshi, Tadahiko; Oyama, Tetsuo; Ozawa, Yoshihiro; and Itoh, Shin-ichi, 5,182,075, Cl. 376-150.000.
Itozaki, Hideo; Hattori, Hisao; Harada, Keizo; and Higaki, Kenjiro, to Sumitomo Electric Industries, Ltd. Process and apparatus for preparing superconducting thin films. 5,182,256, Cl. 505-1.000.
ITT Corporation: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.
Mosquera, Rene A.; and Lin, Michael A., 5,181,855, Cl. 439-74.000.
Roe, Bob J., 5,182,155, Cl. 428-116.000.
Schiel, Lothar; von Gruenberg, Hubertus; Wagner, Wilfried; Rueffer, Manfred; and Jung, Christoph, 5,181,769, Cl. 303-114.300.
Welsh, David E., 5,181,863, Cl. 439-610.000.
ITT Flygt AB: *See*—
Forssberg, Alf; and Fredriksson, Boris, 5,181,729, Cl. 277-62.000.
Iuchi, Sadao: *See*—
Matsui, Shigetomo; Uenishi, Masahiro; Iuchi, Sadao; Sugimoto, Kouji; Itoga, Kouyu; Harada, Tetsuzo; Michiba, Kouji; Onda, Katsuhiro; and Okumura, Takaaki, 5,182,775, Cl. 382-8.000.
Iura, Teruo: *See*—
Ueda, Masanori; Tsuchinaga, Masamitsu; Iura, Teruo; and Fujiwara, Shigeru, 5,181,970, Cl. 148-610.000.
Iwaasa, Shoji: *See*—
Ohmori, Kiyoshi; Iwaasa, Shoji; and Fujita, Goro, 5,182,742, Cl. 369-116.000.
Iwafune, Seiichiro; Yamaguchi, Kojiro; Takiguchi, Eiji; and Iwata, Toshiro, to Bridgestone Corporation. Pneumatic tire having expanded outer tread rubber layer. 5,181,976, Cl. 152-209.00R.
Iwai, Noriyuki; Sasaki, Kimito; Yano, Masaru; Wakimoto, Fumiyoshi; Tokunaga, Wataru; and Shirakura, Masaru, to Honda Giken Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Honda Lock. Turn-over type rearview door mirror. 5,182,676, Cl. 359-841.000.
Iwakura, Syuji: *See*—
Akutsu, Mitsuo; and Iwakura, Syuji, 5,181,988, Cl. 162-135.000.
Iwama, Shinji: *See*—
Yoshimi, Tomohisa; Iwama, Shinji; Kajino, Yuuichi; and Sugi, Hikaru, 5,181,654, Cl. 236-91.00C.
Iwamoto, Akiko: *See*—
Tsuda, Yoshiyuki; and Iwamoto, Akiko, 5,181,558, Cl. 165-133.000.
Iwamoto, Shigeru: *See*—
Kawasaki, Masahiro; Takahashi, Hiroyuki; and Iwamoto, Shigeru, 5,182,591, Cl. 354-195.100.
Iwano, Hideaki: *See*—
Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, 5,182,757, Cl. 372-45.000.
Iwasa, Akira: *See*—
Kurazumi, Toshiaki; Mizuno, Hireyuki; Imamori, Katsumi; and Iwasa, Akira, 5,182,112, Cl. 424-439.000.
Iwasaki, Tameo; Kondo, Kazuhiko; Matsuoka, Yuzo; Matsumoto, Mamoru; and Sugiura, Masaki, to Tanabe Seiyake Co., Ltd. Biphenyl derivatives, process for preparing the same and intermediates therefor. 5,182,404, Cl. 548-237.000.
Iwata, Hiroshi: *See*—
Nakai, Hideo; Yamada, Koichiro; Nomura, Shumihiro; Matsumoto, Mamoru; and Iwata, Hiroshi, 5,182,296, Cl. 514-376.000.
Iwata, Noriyuki: *See*—
Hirose, Ichiro; Handa, Tomohisa; Iwata, Noriyuki; and Choshi, Masahiro, 5,181,485, Cl. 123-90.170.
Iwata, Toshiro: *See*—
Iwafune, Seiichiro; Yamaguchi, Kojiro; Takiguchi, Eiji; and Iwata, Toshiro, 5,181,976, Cl. 152-209.00R.
Iwatate, Fujio: *See*—
Kishi, Fumio; Akaike, Masatake; Yamamoto, Keisuke; Motoi, Taiko; Kaneko, Norio; Iwatate, Fujio; Ohmi, Kazuaki; Kawasaki, Takehiko; and Shinjou, Atsuko, 5,182,253, Cl. 505-1.000.
Izatt, Reed M.: *See*—
Bruening, Ronald L.; Tarbet, Bryon J.; Bradshaw, Jerald S.; Izatt, Reed M.; and Krakowiak, Krzysztof E., 5,182,251, Cl. 502-401.000.
Izawa, Katsuyoshi; Kobayashi, Ryoichi; and Ozawa, Masayuki, to Hitachi, Ltd. Semiconductor device having particular solder interconnection arrangement. 5,182,628, Cl. 257-707.000.
Izumi, Masahiro; Aoshima, Toshiharu; Ide, Yutaka; Terawaki, Ritsuko; and Hosoya, Hideaki, to Honda Giken Kogyo Kabushiki Kaisha. Intake system in multi-cylinder type internal combustion engine. 5,181,491, Cl. 123-336.000.
Jack, Kurt K. J.; and Alber, Gerhard G. A., to Thyssen Industries AG Maschinenbau. Method and apparatus for removing target sections of sheet metal from a continuous coil and placing those sections in separate continuous coils in a continuous operation. 5,182,428, Cl. 219-121.630.
Jackson, Craig M.: *See*—
Rigbi, Meir; and Jackson, Craig M., 5,182,113, Cl. 424-537.000.
Jackson, Delbert D.: *See*—
Barker, Stephen F.; Ricchio, Samuel G.; Benton, Glenn A.; and Jackson, Delbert D., 5,182,083, Cl. 422-63.000.
Jacobine, Anthony F.; and Nakos, Steven T., to Loctite Corporation. Tris(norbornenyl) isocyanurate. 5,182,360, Cl. 528-205.000.
Jacobs, David R.: *See*—
Hollander, Milton B.; and Jacobs, David R., 5,181,650, Cl. 229-103.000.
Jacobs, Jochen: *See*—
Bauer, Volker; Rachse, Wilfried; Koester, Klaus; and Jacobs, Jochen, 5,182,054, Cl. 264-15.000.
Jacobs, Paul F.: *See*—
Allison, Joseph W.; Richter, Jan; Childers, Craig M.; Smalley, Dennis R.; Hull, Charles W.; and Jacobs, Paul F., 5,182,055, Cl. 264-22.000.
Jacobs Suchard AG: *See*—
Blaser, Eric; and Zumbe, Albert, 5,182,114, Cl. 424-673.000.
Jacobsen, Gary A.; and Jacobsen, Roger V. Printed image creating the perception of depth. 5,181,745, Cl. 283-94.000.
Jacobsen, Roger V.: *See*—
Jacobsen, Gary A.; and Jacobsen, Roger V., 5,181,745, Cl. 283-94.000.
Jaecklin, Felix P. Building element for supporting grid walls with a bulk material filling. 5,181,351, Cl. 52-35.000.
Jaffe, Mike: *See*—
Chen, Paul, Sr.; Sullivan, Vincent; Dolce, Thomas; and Jaffe, Mike, 5,182,334, Cl. 525-397.000.
Jagt, Clarence D. Tool for measuring the travel of a vehicle brake rod. 5,181,440, Cl. 81-484.000.
Jain, Ravi, to BOC Group, Inc., The. Continuous method for removing oil vapor from feed gases containing water vapor. 5,181,942, Cl. 55-31.000.
Jakubowski, Joseph A.: *See*—
Maraganore, John M.; and Jakubowski, Joseph A., 5,182,260, Cl. 514-12.000.
Jalinski, Thomas J., to Oscar Mayer Foods Corporation. Time temperature indicator with distinct end point. 5,182,212, Cl. 436-2.000.
Jang, Ren-Yue. Device for controlling dissolution of a solid cleanser. 5,181,281, Cl. 4-227.200.
Jang, Seong J., to Gold Star Electron Co., Ltd. Method for fabrication of a field oxide of the buried inverse T-type using oxygen or nitrogen ion implantation. 5,182,226, Cl. 437-70.000.
Jani, Rajni: *See*—
DeSantis, Louis, Jr.; and Jani, Rajni, 5,182,102, Cl. 424-78.100.
Janota, Kenneth F.; and Miskin, Michael J., to Molex Incorporated. Method of assembling an electrical connector. 5,181,318, Cl. 29-882.000.
Japan Aviation Electronics Industry Limited: *See*—
Honma, Kazuhiro; Watanabe, Kunio; Morita, Takeshi; and Nanao, Shingo, 5,181,860, Cl. 439-321.000.
Japan Electronic Control Systems Co. Ltd.: *See*—
Tomisawa, Naoki, 5,182,710, Cl. 364-424.100.
Japan Synthetic Rubber Co., Ltd.: *See*—
Ono, Hisao; Ito, Katsumi; Uekawa, Tatuo; and Ishikawa, Katsuhiro, 5,182,343, Cl. 526-240.000.
Japan Tobacco Inc.: *See*—
Mima, Yoshinobu, 5,181,334, Cl. 40-524.000.
Jarvenpaa, Viljo, to Wiser Oy. Wet blaster/wet washer. 5,181,944, Cl. 55-235.000.
Jayswal, Manu: *See*—
Krutsch, John R.; and Jayswal, Manu, 5,181,722, Cl. 273-127.00B.
Jennings, David G.: *See*—
Davis, John M.; Davis, Mark E.; and Jennings, David G., 5,181,290, Cl. 15-98.000.
Jennmar Corporation: *See*—
Stankus, John C.; Stewart, Eugene H.; and Grissinger, Glen S., 5,181,800, Cl. 405-259.600.

JEOL Ltd.: *See*—
Matsuda, Hiroshi; and Suzuki, Michitaka, 5,182,454, Cl. 250-310.000.
JEOL Technics Co. Ltd.: *See*—
Matsuda, Hiroshi; and Suzuki, Michitaka, 5,182,454, Cl. 250-310.000.
Jerome, Michael E.; and Jerome, Thomas A., to Heyco Stamped Products, Inc. High retention low insertion force electric female disconnect. 5,181,866, Cl. 439-850.000.
Jerome, Thomas A.: *See*—
Jerome, Michael E.; and Jerome, Thomas A., 5,181,866, Cl. 439-850.000.
Jeromson, James R., Jr.: *See*—
Anderson, J. Edward C.; and Jeromson, James R., Jr., 5,181,636, Cl. 222-389.000.
Jeron Technology, Inc.: *See*—
Halliburton, Ronald, 5,181,721, Cl. 273-177.00A.
Johansen, Roger: *See*—
Pote, William; Johansen, Roger; and Pote, Thomas, 5,181,316, Cl. 29-828.000.
Johnson, Allan H.; and Woodbridge, Donald A., to Boeing Corporation, The. System and method for structural monitoring using optical imaging of fiber sensors. 5,182,449, Cl. 250-227.140.
Johnson, Drey; Gaude, Robert; Farrow, Robert I.; DeMint, Paul; and McNeill, Ray O., to Concept Design. Cassette loader with simultaneous leader tape equalization and loading. 5,181,669, Cl. 242-56.00R.
Johnson, Drey: *See*—
Farrow, Robert I.; Johnson, Drey; and Gaude, Robert, 5,181,667, Cl. 242-56.00R.
Johnson, Eric A.; Schreiber, David; Ho, Kwok P.; Hall, William T.; Yang, Huei-hsiung; and Geldiay-Tuncer, Beril, to Igene Biotechnology, Inc. Processes for in vivo production of astaxanthin and phaffia rhodozyma yeast of enhanced astaxanthin content. 5,182,208, Cl. 435-254.000.
Johnson, Fontain M., to Midland Enterprises Inc. Liquid spill device arrangement for liquid transfer in a closed system. 5,181,547, Cl. 141-46.000.
Johnson, Leo: *See*—
Anthon, Douglas W.; Clark, John H.; Johnson, Leo; and Pier, Timothy J., 5,182,759, Cl. 372-72.000.
Johnson, Robert J. Method for in situ dispensing of cementitious materials at remote locations. 5,182,057, Cl. 264-31.000.
Joncour, Christian; Chansavoir, Alain; and Marande, Bruno, to Essilor International CIE Generale d'Optique. Device for fastening a holding part on an eyeglass lens. 5,181,344, Cl. 51-165.750.
Jones, E. Tracy T.: *See*—
Helms, Gregory L.; Horn, Wendy S.; Jones, E. Tracy T.; and Linemeyer, David L., 5,182,298, Cl. 514-455.000.
Jones, Frank L.: *See*—
Mueller, Mark D.; Jones, Frank L.; Quintana, Julio M.; Ruddy, Kenneth E.; and Mims, Michael G., 5,181,571, Cl. 166-381.000.
Jones, Gary A., to Hammer Corporation, The. Incline press exercise machine. 5,181,896, Cl. 482-97.000.
Jones, Philip J., to Raychem Corporation. Liquid crystal display having improved retroreflector. 5,182,663, Cl. 359-70.000.
Jones, Warren C.: *See*—
Joyce, James L., Jr.; Jones, Warren C.; Rowlette, John R., Sr.; MacInnes, David F., Jr.; and Vyas, Navin N., 5,182,050, Cl. 252-500.000.
Jones, Winton D.: *See*—
Sunkara, Sai P.; and Jones, Winton D., 5,182,293, Cl. 514-340.000.
Jonsson, Eston; and Waern, Roland, to Swedima, Inc. Preparation for prevention of emission of mercury from amalgam fillings and method. 5,182,099, Cl. 424-49.000.
Joppig, Peter: *See*—
Schmid, Friedrich; Joppig, Peter; and Klak, Roland, 5,182,437, Cl. 219-270.000.
Jordens, Ernst-Gunter; and Siemer, Hubert, to Lemforder Metallwaren AG. Elastic sliding bearing III. 5,181,784, Cl. 384-222.000.
Jorgensen, Anker S.; Stidsen, Carsten E.; Faarup, Peter; Gronvald, Frederik C.; and Nielsen, Flemming E., to Novo Nordisk A/S. Benzothienopyrazinedione compounds and their preparation and use. 5,182,279, Cl. 514-250.000.
Jorgenson, James C.: *See*—
Gaver, Joseph C., Jr.; and Jorgenson, James C., 5,181,861, Cl. 439-578.000.
Josephson, Arnold, to Leviton Manufacturing Company, Inc. Method of making a threaded insert assembly. 5,181,310, Cl. 29-517.000.
Jovero, Olli, to Neste Oy. Method for manufacturing a joint and a joint between sections to be joined to each other and surrounded by a joining compound. 5,181,747, Cl. 285-21.000.
Joyce, James L., Jr.; Jones, Warren C.; Rowlette, John R., Sr.; MacInnes, David F., Jr.; and Vyas, Navin N., to AMP Incorporated. Extrinsically/intrinsically conductive gel. 5,182,050, Cl. 252-500.000.
Jun-Jie, Yang. Heat-venting insulating article. 5,181,287, Cl. 5-482.000.
Jung, Christoph: *See*—
Schiel, Lothar; von Gruenberg, Hubertus; Wagner, Wilfried; Rueffer, Manfred; and Jung, Christoph, 5,181,769, Cl. 303-114.300.
Jurewicz, Romuald M.: *See*—
Hanson, Jay L.; and Jurewicz, Romuald M., 5,181,389, Cl. 62-126.000.
Jutamulia, Suganda; Fujita, Akihiro; Toyoda, Shinji; Kojima, Atsushi; and Ito, Eiichi. Real-time analytic pseudocolor encoder system. 5,182,639, Cl. 358-81.000.
K. G. Roberts & Associates: *See*—
Roberts, Kenneth G.; and Roberts, Elaine E., 5,182,616, Cl. 356-402.000.
Kabi Pharmacia AB: *See*—
Hedegaard, Kurt; Albrectsen, Sten; and Hansen, Jens, 5,182,081, Cl. 422-56.000.
Kabushiki Kaisha CSK: *See*—
Horie, Kiyoshi, 5,182,737, Cl. 369-47.000.
Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Ono, Takahiko; and Endo, Youichi, 5,181,504, Cl. 128-36.000.
Kabushiki Kaisha Honda Lock: *See*—
Iwai, Noriyuki; Sasaki, Kimito; Yano, Masaru; Wakimoto, Fumiyoshi; Tokunaga, Wataru; and Shirakura, Masaru, 5,182,676, Cl. 359-841.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Takahashi, Hideki, 5,182,414, Cl. 84-634.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Mishima, Ken; Mimura, Akio; Takahara, Yoshimasa; Asami, Kouji; and Hanai, Tetsuya, 5,182,193, Cl. 435-29.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kitoh, Hidenori, 5,182,713, Cl. 364-424.010.
Tsukamoto, Toshio; and Minami, Yoshihito, 5,181,577, Cl. 175-261.000.
Kabushiki Kaisha KOSMEK: *See*—
Yonezawa, Keitaro, 5,181,700, Cl. 269-24.000.
Yonezawa, Keitaro, 5,181,701, Cl. 269-32.000.
Kabushiki Kaisha Machida Seisakusho: *See*—
Koshikawa, Nobuo; and Inoue, Masahiro, 5,181,545, Cl. 140-92.100.
Kabushiki Kaisha Shinkawa: *See*—
Ushiki, Hiroshi; and Noboru, Fujino, 5,181,646, Cl. 228-4.500.
Kabushiki Kaisha Shoun Kosakusho: *See*—
Nezu, Masahiro, 5,181,442, Cl. 82-19.000.
Kabushiki Kaisha Showa Seisakusho: *See*—
Abe, Shigenobu, 5,181,696, Cl. 267-64.170.
Kabushiki Kaisha TOPCON: *See*—
Waki, Michio; and Takada, Shinzo, 5,182,756, Cl. 372-38.000.
Kabushiki Kaisha Toshiba: *See*—
Goto, Kuniaki, 5,182,480, Cl. 307-608.000.
Handa, Kiyoji; Mukaeda, Satoshi; Kanai, Hideyuki; Yamashita, Yohachi; Furukawa, Osamu; and Harata, Mitsuo, 5,182,695, Cl. 361-321.000.
Hibino, Sadayoshi; Sato, Tadayuki; and Mochizuki, Motoyasu, 5,182,483, Cl. 310-211.000.
Inoue, Kazuhiko, 5,182,233, Cl. 437-226.000.
Ishii, Takaaki; and Kuge, Toru, 5,182,765, Cl. 379-88.000.
Kimata, Yoshihide; Yasuki, Seijiro; Ogawa, Yoshihiko; and Kawai, Kiyoyuki, 5,182,644, Cl. 358-140.000.
Kobayashi, Takaichi; Shibasaki, Kazuka; Hosoi, Takashi; Honda, Masami; and Takahashi, Kazuyoshi, 5,182,698, Cl. 361-395.000.
Kobayashi, Takaichi; and Yoshida, Mitsuhiro, 5,182,699, Cl. 361-395.000.
Kuriki, Hideaki, 5,181,562, Cl. 165-166.000.
Mochikawa, Hiroshi; Hirose, Tatsuya; and Horiguchi, Taki, 5,182,701, Cl. 363-98.000.
Motoyanagi, Teruo, 5,182,655, Cl. 358-406.000.
Ohkubo, Yasuo, 5,182,466, Cl. 307-127.000.
Shimada, Toshiro, 5,182,500, Cl. 318-254.000.
Shuto, Naoki; Ueno, Fumio; Goto, Yoshiko; Horiguchi, Akihiro; Kasori, Mitsuo; and Imai, Motomasa, 5,182,540, Cl. 338-223.000.
Tanaka, Tetsukazu; Imai, Masahiro; Ikeda, Hiroshi; and Makino, Yosiyuki, 5,181,398, Cl. 68-12.060.
Yamaguchi, Kentoku; and Sato, Kenichi, 5,182,769, Cl. 379-387.000.
Yoshida, Yoshihiro, 5,182,471, Cl. 307-355.000.
Kabushiki Kaisha Toyoda Jidoshokii Seisakusho: *See*—
Ikeda, Hayato; Fujii, Toshiro; Yokomachi, Naoya; and Takemoto, Shoji, 5,181,834, Cl. 417-269.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kayukawa, Hiroaki; Kimura, Kazuya; Takenaka, Kenji; and Okuno, Takuya, 5,181,453, Cl. 92-12.200.
Kageyama, Minoru; and Torikata, Yasuo, to Rheon Automatic Machinery Co., Ltd. Method and apparatus for producing a sheet of dough. 5,182,124, Cl. 426-19.000.
Kai, Yoshiaki: *See*—
Murai, Mikio; Takahashi, Kiyoshi; Odagiri, Masaru; Kai, Yoshiaki; Suzuki, Takashi; and Kunieda, Toshiaki, 5,182,132, Cl. 427-577.000.
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Leach, Christopher B., deceased; and Kaines, John L., 5,181,363, Cl. 52-685.000.
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Kajino, Yuuichi: *See*—
Yoshimi, Tomohisa; Iwama, Shinji; Kajino, Yuuichi; and Sugi, Hikaru, 5,181,654, Cl. 236-91.00C.
Kajita, Masaharu: *See*—
Kawasaki, Shinji; Kajita, Masaharu; and Matsuhiro, Keiji, 5,182,059, Cl. 264-65.000.

Kajitani, Makoto: *See*—
Suzuki, Masahiro; Nozaki, Kenji; Kajitani, Makoto; Yasumoto, Mitsugi; Ono, Naohiko; and Shindo, Takashi, 5,182,284, Cl. 514-255.000.

Kajiwara, Kazuo: *See*—
Katori, Kenji; Hayakawa, Masatoshi; Aso, Koichi; Hayashi, Kazuhiko; and Kajiwara, Kazuo, 5,182,690, Cl. 360-120.000.

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Kakei, Tsutomu: *See*—
Kaneko, Nobuyoshi; and Kakei, Tsutomu, 5,181,997, Cl. 204-129.100.

Kaken Co., Ltd.: *See*—
Makita, Kohzoh; and Machida, Tohru, 5,181,921, Cl. 606-195.000.

Kakita, Akihiko; Sugizaki, Tsugio; and Fujii, Yozo, to Konica Corporation. Image forming apparatus. 5,182,602, Cl. 355-271.000.

Kalef, Harvey: *See*—
Lang, Stefan; and Kalef, Harvey, 5,182,063, Cl. 264-132.000.

Kamijo, Akinori: *See*—
Masuda, Toru; and Kamijo, Akinori, 5,182,550, Cl. 340-825.050.

Kamimura, Masatsugu, to Fujitsu Ten Limited. Computing method of floating-point represented data. 5,182,723, Cl. 364-748.000.

Kamimura, Takashi: *See*—
Hongo, Mikio; Mizukoshi, Katsuro; Sano, Shyuzo; Kamimura, Takashi; and Takahashi, Takahiko, 5,182,231, Cl. 437-173.000.

Kaminski, James J.: *See*—
Ting, Pauline C.; Sherlock, Margaret H.; Tom, Wing C.; and Kaminski, James J., 5,182,289, Cl. 514-278.000.

Kamiya, Kaoru: *See*—
Ohta, Kiyohiko; Kamiya, Kaoru; Watanabe, Keiko; Nakagawa, Makoto; and Nagao, Tomio, 5,181,604, Cl. 206-5.100.

Kan, Toshiya; and Sakamoto, Katsuhiko, to Mazda Motor Corporation. Cam timing control device for automotive engine. 5,181,484, Cl. 123-90.170.

Kanai, Hideyuki: *See*—
Handa, Kiyoji; Mukaeda, Satoshi; Kanai, Hideyuki; Yamashita, Yohachi; Furukawa, Osamu; and Harata, Mitsuo, 5,182,695, Cl. 361-321.000.

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Kanda, Fujihiro: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Kane, John M., to Merrell Dow Pharmaceuticals Inc. Process for preparing piperidinyl benzimidazoles. 5,182,399, Cl. 546-199.000.

Kaneko, Nobuyoshi; and Kakei, Tsutomu, to Fuji Photo Film Co., Ltd. Apparatus and method for continuously electrolyzing aluminum products. 5,181,997, Cl. 204-129.100.

Kaneko, Norio: *See*—
Kishi, Fumio; Akaike, Masatake; Yamamoto, Keisuke; Motoi, Taiko; Kaneko, Norio; Iwatate, Fujio; Ohmi, Kazuaki; Kawasaki, Takehiko; and Shinjou, Atsuko, 5,182,253, Cl. 505-1.000.

Kaneko, Yuji, to Sodick Co., Ltd. Pulse control circuit for electric discharge machine using programmable logic. 5,182,474, Cl. 307-465.000.

Kano, Toshio: *See*—
Sagawa, Seiji; Kano, Toshio; Yachigo, Shinichi; and Ida, Kanako, 5,182,390, Cl. 544-222.000.

Kansai Paint Co., Ltd.: *See*—
Kinaga, Yoshimasa; Ogawa, Masao; and Kiyomura, Yoshihiro, 5,182,786, Cl. 385-128.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Matsuzawa, Shigeji; Yuasa, Eiji; Tanaka, Junichiro; and Nakamura, Teruo, 5,182,138, Cl. 427-157.000.

Kao Corporation: *See*—
Takata, Noboru; Arai, Junko; and Yorozu, Hidenori, 5,182,105, Cl. 424-78.020.
Tanaka, Nobuhiro; Tawara, Hirotoshi; and Hirata, Eiji, 5,181,818, Cl. 414-414.000.

Kaplan, Abraham M.; and Kaplan, Joyce. Sliding aircraft door. 5,181,677, Cl. 244-129.500.

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Kaplan, Abraham M.; and Kaplan, Joyce, 5,181,677, Cl. 244-129.500.

Kapp, David C.; Boston, Russell E.; Carlblom, Leland H.; McKinley, Mildred L.; and Kozma, Jess A., to PPG Industries, Inc. Coatings and method for coloring light-transmitting containers. 5,182,148, Cl. 428-34.600.

Karafian, Maxim; and Tsang, Irving C., to Stone & Webster Engineering Corp. Apparatus for production of synthesis gas using convective reforming. 5,181,937, Cl. 48-95.000.

Karas, Christopher R.; and Hoch, Carl B., III, to Karas, Christopher R.; and Hoch, Carl B., III. Method and apparatus for encoding, transmitting, receiving and de-coding information. 5,182,772, Cl. 380-49.000.

Karaskiewicz, Ronald J.: *See*—
Hofstra, Joseph S.; Karaskiewicz, Ronald J.; and Fischer, Mark R., 5,181,883, Cl. 454-49.000.

Karita, Seiichiro: *See*—
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.
Kashimura, Makoto; Nakagomi, Hiroshi; Karita, Seiichiro; Fukuda, Tsuguhiro; Kimura, Tetsuo; Hirano, Hirofumi; and Kurata, Mitsuru, 5,182,581, Cl. 346-140.00R.

Kariya, Takao: *See*—
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Mizusawa, Nobutoshi; Suda, Shigeyuki; Nose, Noriyuki; and Kariya, Takao, 5,182,615, Cl. 356-400.000.

Karnin, Ehud D.: *See*—
Chevion, Dan S.; Karnin, Ehud D.; and Walach, Eugeniusz, 5,182,656, Cl. 358-452.000.

Karp, Gary M.: *See*—
Condon, Michael E.; Karp, Gary M.; and Birk, Jeffrey H., 5,182,397, Cl. 546-15.000.

Kartridg Pak Co., The: *See*—
Smith, Rodney P.; and Vens, Gregory C., 5,181,366, Cl. 53-470.000.

Karube, Nagahisa: *See*—
Nagai, Shigeki; Sato, Haruo; and Karube, Nagahisa, 5,181,959, Cl. 106-211.000.

Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , to Spojene Podniky Pro Zdravotnickou Vyrobu. Cell-protective composition for preventing or treating of peptic ulcer. 5,182,285, Cl. 514-255.000.

Kasai, Syoji: *See*—
Suzuki, Masato; Inaba, Hiromi; Takenaga, Hiroshi; Yamazaki, Masachika; Oonuma, Naoto; Nakamura, Kiyoshi; Sakai, Yoshio; Yoneda, Kenji; Nakata, Naofumi; and Kasai, Syoji, 5,182,776, Cl. 382-14.000.

Kasasaku, Takami: *See*—
Shirai, Nobuo; and Kasasaku, Takami, 5,182,762, Cl. 375-122.000.

Kashdan, David S.: *See*—
Cook, Phillip M.; and Kashdan, David S., 5,182,379, Cl. 536-63.000.

Kashimura, Makoto; Nakagomi, Hiroshi; Karita, Seiichiro; Fukuda, Tsuguhiro; Kimura, Tetsuo; Hirano, Hirofumi; and Kurata, Mitsuru, to Canon Kabushiki Kaisha. Ink jet recording unit having an ink tank section containing porous material and a recording head section. 5,182,581, Cl. 346-140.00R.

Kasori, Mitsuo: *See*—
Shuto, Naoki; Ueno, Fumio; Goto, Yoshiko; Horiguchi, Akihiro; Kasori, Mitsuo; and Imai, Motomasa, 5,182,540, Cl. 338-223.000.

Kassai, Kenzou. Bed apparatus and rehabilitation attachment. 5,181,289, Cl. 5-612.000.

Kasuga, Kazuyuki; Hirose, Takuji; Takahashi, Toshikazu; and Hiratani, Kazuhisa, to Director-General of Agency of Industrial Science and Technology. α-Amino acid diamide and use thereof as cupric ion-transporting ionophore. 5,182,398, Cl. 546-171.000.

Kataoka, Hideaki, to Fuji Photo Film Co., Ltd. Photograhic film cassette. 5,181,672, Cl. 242-71.100.

Katho, Kimitoshi: *See*—
Takuma, Keisuke; Irizato, Yoshihiro; and Katho, Kimitoshi, 5,182,409, Cl. 556-146.000.

Kato, Funiaki: *See*—
Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; Kato, Funiaki; and Hirota, Katsuaki, 5,182,636, Cl. 358-41.000.

Kato, Katsuhisa, to Tokiway Chemical Industries, Co., Ltd.; and System Technical Industries Co., Ltd. Bright tape for molding. 5,182,145, Cl. 428-31.000.

Kato, Masakazu; Ishikawa, Takatoshi; and Ishikawa, Tetsuo, to Alps Electric Co., Ltd. Thermal head. 5,182,574, Cl. 346-76.0PH.

Kato, Masao: *See*—
Daenen, Robert H. C. M.; Lillelund, Stig; Kato, Masao; Lonergan, Peter; and Picozza, Augusto A., 5,181,626, Cl. 220-282.000.

Kato, Motoi; and Nagashima, Yoshitake, to Canon Kabushiki Kaisha. Image forming apparatus. 5,182,575, Cl. 346-108.000.

Kato, Osamu: *See*—
Uemura, Seiichi; Sohda, Yoshio; Kato, Osamu; Kouno, Takefumi; and Kihara, Tsutomu, 5,181,979, Cl. 156-89.000.

Katoh, Eiichi: *See*—
Hasegawa, Shin; Oyama, Hajime; Katoh, Eiichi; and Moriya, Masao, 5,182,600, Cl. 355-246.000.

Katoh, Ryusuke: *See*—
Motoyama, Yu; and Katoh, Ryusuke, 5,181,493, Cl. 123-431.000.

Katoh, Shunji: *See*—
Hodoshima, Takashi; and Katoh, Shunji, 5,182,601, Cl. 355-270.000.

Katori, Kenji; Hayakawa, Masatoshi; Aso, Koichi; Hayashi, Kazuhiko; and Kajiwara, Kazuo, to Sony Corporation. Fe-N-based soft magnetic thin films and magnetic heads using such films. 5,182,690, Cl. 360-120.000.

Kaufman, Marvin L.: *See*—
Pettit, Paul H., Jr.; Singer, Debra L.; and Kaufman, Marvin L., 5,182,337, Cl. 525-176.000.

Kautz, Randall: *See*—
Lazarus, Richard M.; Kautz, Randall; and Dixit, Sunit S., 5,182,184, Cl. 430-165.000.

Kawabata, Motonobu, to Dainippon Screen Mfg. Co., Ltd. Optical beam scanning system having an image-forming system for reshaping a light beam to be applied to a scanning reflector. 5,182,668, Cl. 359-218.000.

Kawabata, Takao: *See*—
Yamamoto, Yuushin; Sashida, Nobuo; Yamasaki, Yuuko; and Kawabata, Takao, 5,182,463, Cl. 307-46.000.

Kawabe, Yutaka, to Idemitsu Kosan Co., Ltd. Organic optical logic device. 5,182,666, Cl. 359-107.000.

Kawade, Hisaaki: *See*—
Yanagisawa, Yoshihiro; Sakai, Kunihiro; Takamatsu, Osamu; Eguchi, Ken; Matsuda, Hiroshi; Kawade, Hisaaki; and Takeda, Toshihiko, 5,182,724, Cl. 365-151.000.

Kawaguchi, Masami: *See*—
Miyashita, Akimi; Fujii, Mutsumasa; Kubosawa, Minoru; Torii, Keiichiro; Ooki, Nobuaki; Kogawa, Kiyonori; Kawaguchi, Masami; Murooka, Hideyasu; and Kyooi, Masayuki, 5,182,121, Cl. 425-338.000.

Kawaguchi, Sadatsugu: *See*—
Maruyama, Junichi; Fukumura, Teruo; and Kawaguchi, Sadatsugu, 5,181,575, Cl. 173-180.000.

Kawai, Kiyoyuki: *See*—
Kimata, Yoshihide; Yasuki, Seijiro; Ogawa, Yoshihiko; and Kawai, Kiyoyuki, 5,182,644, Cl. 358-140.000.

Kawakita, Kenji: *See*—
Harafuji, Kenji; Misaka, Akio; Hamaguchi, Hiromitsu; and Kawakita, Kenji, 5,182,718, Cl. 364-490.000.

Kawamura, Takahisa: *See*—
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Matsui, Shigetomo; Uenishi, Masahiro; Iuchi, Sadao; Sugimoto, Kouji; Itoga, Kouyu; Harada, Tetsuzo; Michiba, Kouji; Onda, Katsuhiro; and Okumura, Takaaki, 5,182,775, Cl. 382-8.000.

Kawasaki, Keiichi: *See*—
Ohkoda, Keiji; Kudo, Tomohiro; Shimizu, Satoshi; and Kawasaki, Keiichi, 5,181,715, Cl. 271-272.000.

Kawasaki, Masahiro; Takahashi, Hiroyuki; and Iwamoto, Shigeru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera system. 5,182,591, Cl. 354-195.100.

Kawasaki, Shinji; Kajita, Masaharu; and Matsuhiro, Keiji, to NGK Insulators, Ltd. Process for producing high density SiC sintered bodies. 5,182,059, Cl. 264-65.000.

Kawasaki Steel Corporation: *See*—
Komatsubara, Michiro; Kurosawa, Mitsumasa; Hayakawa, Yasuyuki; Iida, Yoshiaki; and Sadayori, Toshio, 5,181,972, Cl. 148-111.000.
Yuge, Noriyoshi; Baba, Hiroyuki; and Aratani, Fukuo, 5,182,091, Cl. 423-348.000.

Kawasaki, Takehiko: *See*—
Kishi, Fumio; Akaike, Masatake; Yamamoto, Keisuke; Motoi, Taiko; Kaneko, Norio; Iwatate, Fujio; Ohmi, Kazuaki; Kawasaki, Takehiko; and Shinjou, Atsuko, 5,182,253, Cl. 505-1.000.

Kawashima, Eric H.: *See*—
Allet, Bernard; and Kawashima, Eric H., 5,182,196, Cl. 435-69.500.

Kawashima, Tetsuji: *See*—
Watanabe, Tetsu; Kawashima, Tetsuji; and Fujita, Goro, 5,182,734, Cl. 369-13.000.

Kawata, Kazuhide: *See*—
Mizuse, Harumi; and Kawata, Kazuhide, 5,182,807, Cl. 395-700.000.

Kay, Ian T.: *See*—
Lewis, Terence; Bansal, Harjinder S.; Sundley, Raymond L.; Bartley, Michael R.; Hepworth, Walter; Gilman, David J.; Kay, Ian T.; and Collins, David J., 5,182,402, Cl. 548-204.000.

Kayanuma, Nobuaki, to Toyota Jidosha Kabushiki Kaisha. Apparatus for diagnosing abnormality in fuel injection system and fuel injection control system having the apparatus. 5,181,499, Cl. 123-690.000.

Kayashima, Kazuhiro; Tateishi, Fumikazu; and Ohshima, Kiyoko, to Matsushita Electric Industrial Co., Ltd. Infrared optical fiber and a method of manufacturing the same. 5,182,790, Cl. 385-141.000.

Kayukawa, Hiroaki; Kimura, Kazuya; Takenaka, Kenji; and Okuno, Takuya, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Variable displacement compressor. 5,181,453, Cl. 92-12.200.

Kazecki, Henry L.; and Baker, James C., to Motorola, Inc. Receiver for recovering data in a forward and reverse direction in time. 5,182,749, Cl. 370-100.100.

Keenan, Douglas M., to Thomson Consumer Electronics, Inc. Linkable scan lists for a television receiver. 5,182,646, Cl. 358-193.100.

Kegel Company, Inc.: *See*—
Davis, John M.; Davis, Mark E.; and Jennings, David G., 5,181,290, Cl. 15-98.000.

Keilert, Jurgen: *See*—
Nogossek, Alfred; and Keilert, Jurgen, 5,182,115, Cl. 425-71.000.

Kel Corporation: *See*—
Kobayashi, Takaichi; Shibasaki, Kazuka; Hosoi, Takashi; Honda, Masami; and Takahashi, Kazuyoshi, 5,182,698, Cl. 361-395.000.

Keller, Guido: *See*—
Kipphan, Helmut; Loffler, Gerhard; Keller, Guido; and Ott, Hans, 5,182,721, Cl. 364-526.000.

Kelly, Larry R.; and Waugh, Geoffrey S., to Loral Aerospace Corp. Transversal filter for parabolic phase equalization. 5,182,530, Cl. 333-18.000.

Kemira Kemi Aktiebolag: *See*—
Kvant, Magnus; and Stendahl, Kjell, 5,182,094, Cl. 423-462.000.

Ker, Ming-Dou; Lee, Chung-Yuan; and Wu, Chung-Yu, to United Microelectronics Corporation. CMOS on-chip ESD protection circuit and semiconductor structure. 5,182,220, Cl. 437-34.000.

Kerk, Thomas: *See*—
Hoelscher, Hans-Juergen; Kerk, Thomas; Tuennermann, Wilfried; and Winnacker, Helmut, 5,182,731, Cl. 367-84.000.

Kerkenaar, Antonius; Schmedding, Diederik J. M.; and Berg, Jan, to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappe Lijk Onderzoektno. Method for preparing p-mentha-8-thiol-3-one. 5,182,194, Cl. 435-130.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Holleck, Helmut, 5,182,238, Cl. 501-91.000.

Kerper, Richard W., to Delbar Products, Inc. Vehicle rear view mirror mounting bracket. 5,181,687, Cl. 248-479.000.

Kersten, Jean; and Delmotte, Yves A., to Baxter International Inc. Infection resistant products. 5,181,276, Cl. 2-161.00R.

Keslowitz, Saul L.: *See*—
Hussey, John P.; Green, Richard M.; and Keslowitz, Saul L., 5,181,823, Cl. 414-730.000.

Kessler, Manfred; and Wolfbeis, Otto S. Method for detection and determination of human serum albumin. 5,182,214, Cl. 436-88.000.

Keys, James F.; and Larsen, Douglas C., to Standard Products Company, The. Variable gap filling system. 5,181,341, Cl. 49-477.000.

Khalifa, Mustafa A.; and Chapp, James, Jr. Steering column guide assembly. 5,181,435, Cl. 74-492.000.

Khan, Muhammad A.; Kuznia, Jonathon N.; and Van Hove, James M., to APA Optics, Inc. Narrow band algan filter. 5,182,670, Cl. 359-359.000.

Kida, Otojiro: *See*—
Shia, Yoshiaki; Mori, Hideaki; Kida, Otojiro; and Taketsugu, Hiroshi, 5,181,779, Cl. 374-139.000.

Kidd, Thomas F.; and Thompson, Stephen A., to Electrovert Ltd. Double acting cylinder for filling dies with molten metal. 5,181,551, Cl. 164-113.000.

Kido, Hiroshi: *See*—
Hiramatsu, Akinori; Okamoto, Futoshi; Kido, Hiroshi; Sako, Hiroyuki; Yamanaka, Yukio; and Yamada, Koji, 5,182,702, Cl. 363-132.000.

Kidokoro, Shinichi: *See*—
Yamate, Kazunori; Kinoshita, Hideo; Uenishi, Chikara; Ugajin, Masafumi; Kidokoro, Shinichi; and Yamagiwa, Hiroshi, 5,182,497, Cl. 315-383.000.

Kiefer, David: *See*—
Wikstrom, Jan A.; Birrittella, Mark S.; Kiefer, David; Smetana, Stephen B.; and Swanson, Vernon W., 5,182,473, Cl. 307-454.000.

Kiener, Andreas; Glockler, Rainer; and Heinzmann, Klaus, to Lonza Ltd. Microbiological process for the production of 6-hydroxypicolinic acid. 5,182,197, Cl. 435-122.000.

Kihara, Tsutomu: *See*—
Uemura, Seiichi; Sohda, Yoshio; Kato, Osamu; Kouno, Takefumi; and Kihara, Tsutomu, 5,181,979, Cl. 156-89.000.

Kikkoman Corporation: *See*—
Kajiyama, Naoki; Masuda, Tsutomu; Tatsumi, Hiroki; and Nakano, Eiichi, 5,182,202, Cl. 435-189.000.

Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; Kato, Funiaki; and Hirota, Katsuaki, to Sony Corporation. Color video camera with auto-white balance control. 5,182,636, Cl. 358-41.000.

Kikuchi, Shigeru: *See*—
Gotoh, Yoshitaka; Kikuchi, Shigeru; Nakazawa, Tetsuo; Miyoshi, Tadahiko; Oyama, Tetsuo; Ozawa, Yoshihiro; and Itoh, Shinichi, 5,182,075, Cl. 376-150.000.

Kikuchi, Shuichi; and Itoh, Masami, to Ricoh Company, Ltd. Zoom lens having high variable magnification. 5,182,673, Cl. 359-691.000.

Kiley, Luanne: *See*—
Indelicato, Joseph A., 5,181,682, Cl. 248-210.000.

Kim, Jae W.; and Chung, In S., to Hyundai Electronics Industries Co., Ltd. Method of making dynamic random access memory cell having a SDHT structure. 5,182,224, Cl. 437-52.000.

Kim, Jong-Woo, to SamSung Electronics Co., Ltd. Multi-color-thermal printer with a movable printer head. 5,182,573, Cl. 346-1.100.

Kim, Ki-Soo, to Akzo N.V. Liquid crystalline diglycidyl compounds. 5,182,394, Cl. 549-557.000.

Kim, Wendy Y.: *See*—
Marcus, Stanley; and Kim, Wendy Y., 5,182,104, Cl. 424-78.070.

Kim, Whan Gi: *See*—
Hay, Allan S.; and Kim, Whan Gi, 5,182,358, Cl. 528-191.000.

Kim, Young D.; and Ha, Byung J., to Pacific Chemical Co., Ltd. Quaternary ammonium-substituted saponin ethers. 5,182,373, Cl. 536-4.100.

Kimata, Yoshihide; Yasuki, Seijiro; Ogawa, Yoshihiko; and Kawai, Kiyoyuki, to Nippon Television Network Corp.; and Kabushiki Kaisha Toshiba. Multiplexed signal receiving apparatus. 5,182,644, Cl. 358-140.000.

Kime, Kenjiro; Egusa, Naoyuki; and Nakamura, Keiji, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for maintaining a disk and optical head in orthogonal relation. 5,182,739, Cl. 369-44.150.

Kimura, Kazuya: *See*—
Kayukawa, Hiroaki; Kimura, Kazuya; Takenaka, Kenji; and Okuno, Takuya, 5,181,453, Cl. 92-12.200.

Kimura, Keizo: *See*—
Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, 5,182,339, Cl. 525-242.000.

Kimura, Masao: *See*—
Yamamoto, Toshihiro; Kimura, Masao; and Saito, Keiichi, 5,182,352, Cl. 526-329.200.

Kimura, Shigeo: *See*—
Yamamoto, Akira; Kimura, Shigeo; Kusaka, Kensaku; Maruta, Hidekazu; and Adachi, Hiroyuki, 5,182,606, Cl. 355-289.000.

Kimura, Tetsuo: *See*—
Kashimura, Makoto; Nakagomi, Hiroshi; Karita, Seiichiro; Fukuda, Tsuguhiro; Kimura, Tetsuo; Hirano, Hirofumi; and Kurata, Mitsuru, 5,182,581, Cl. 346-140.00R.

Kimura, Youichi: *See*—
Yamagishi, Toshio; Kimura, Youichi; Shuto, Tamotsu; and Ito, Tatuya, 5,181,714, Cl. 271-186.000.
Kinaga, Yoshimasa; Ogawa, Masao; and Kiyomura, Yoshihiro, to Kansai Paint Co., Ltd. Active energy beam-curable composition containing particles and coated optical fiber. 5,182,786, Cl. 385-128.000.
Kinetic Sciences Inc.: *See*—
Immega, Guy, 5,181,452, Cl. 91-418.000.
King, Connie L., Sr. Brake drum support apparatus. 5,181,821, Cl. 414-427.000.
King, Jeffrey S.: *See*—
Stamps, Douglass K., Jr.; Ponce de Leon, Lorenzo A.; and King, Jeffrey S., 5,182,568, Cl. 343-702.000.
Kinoshita, Hideo: *See*—
Yamate, Kazunori; Kinoshita, Hideo; Uenishi, Chikara; Ugajin, Masafumi; Kidokoro, Shinichi; and Yamagiwa, Hiroshi, 5,182,497, Cl. 315-383.000.
Kinoshita, Naoyoshi, to Minolta Camera Kabushiki Kaisha. Multi-color image forming apparatus and method of setting image data for same. 5,182,599, Cl. 355-208.000.
Kintz, Donald P.; and Catone, David L., to Nyacol Products Inc. Colloidal antimony pentoxide powders and method of making. 5,182,048, Cl. 252-363.500.
Kipphan, Helmut; Loffler, Gerhard; Keller, Guido; and Ott, Hans, to Heidelberger Druckmaschinen Aktiengesellschaft; and Gretak Aktiengesellschaft. Process and apparatus for controlling the inking process in a printing machine. 5,182,721, Cl. 364-526.000.
Kirchner, John A.: *See*—
Alexander, Rhonda L.; Irrgang, Michael E.; and Kirchner, John A., 5,182,793, Cl. 395-13.000.
Kirk, Kevin A.: *See*—
Chu, Shaw-Chang; and Kirk, Kevin A., 5,182,168, Cl. 428-330.000.
Kirkland, Dan R., to Wayne/Scott Fetzer Company. Sewage pump. 5,181,841, Cl. 417-423.300.
Kise, Shoichi; Hayashida, Mikio; Ori, Aiichiro; Hiratsuka, Junzou; and Yamada, Hideaki, to Mitsui Petrochemical Industries, Ltd. Process for preparing (+)-homopilopic acid. 5,182,198, Cl. 435-126.000.
Kishi, Fumio; Akaike, Masatake; Yamamoto, Keisuke; Motoi, Taiko; Kaneko, Norio; Iwatate, Fujio; Ohmi, Kazuaki; Kawasaki, Takehiko; and Shinjou, Atsuko, to Canon Kabushiki Kaisha. Purification apparatus for superconductor fine particles. 5,182,253, Cl. 505-1.000.
Kishi, Hiroshi, to Mita Industries Co., Ltd. Method of controlling the reception of data. 5,182,651, Cl. 358-296.000.
Kishi, Ikuo: *See*—
Ogawa, Osamu; Kishi, Ikuo; Tahara, Yoshiyuki; and Sugita, Masanori, 5,182,267, Cl. 514-34.000.
Kishimoto, Yoshio: *See*—
Ono, Kiyoshi; Kishimoto, Yoshio; and Satou, Tetsuhito, 5,182,133, Cl. 427-516.000.
Kiss, Robert: *See*—
Duflos, Alain; Patoiseau, Jean-Francois; Bigg, Dennis; and Kiss, Robert, 5,182,273, Cl. 514-83.000.
Kistrup, Holger; and Imhof, Otwin, to Deutsche Automobilgesellschaft mbH. Treating accumulated waste water from plastic substrates activated with Pd/Sn solutions. 5,182,241, Cl. 502-24.000.
Kita, Hideki: *See*—
Fukunaga, Yasuyuki; Kita, Hideki; Nakakuma, Akira; Taniguchi, Toru; Fukui, Hidehiro; and Takemura, Yoshinobu, 5,182,584, Cl. 346-157.000.
Kita, Kiyoshi. Intraocular anticoagulant including antithrombin III and method of administration. 5,182,259, Cl. 514-8.000.
Kitagawa, Naoto: *See*—
Yoshioka, Osami; Matsui, Naoki; Sato, Hiroaki; Omori, Kouji; Yamazaki, Masayuki; Suzuki, Masafumi; Oishi, Hitoshi; Kitagawa, Naoto; Seike, Takaya; and Araki, Yasuhiro, 5,182,074, Cl. 266-87.000.
Kitagishi, Nozomu; and Yamazaki, Shoichi, to Canon Kabushiki Kaisha. Variable magnification optical system having a capability of stabilizing the image. 5,182,671, Cl. 359-557.000.
Kitahama, Michihiro; and Miyazaki, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Method and apparatus for assembling door for motorcar. 5,181,307, Cl. 29-434.000.
Kitahara, Makoto: *See*—
Ueda, Noriyoshi; Takahashi, Yuji; and Kitahara, Makoto, 5,181,705, Cl. 271-3.000.
Kitamura, Hirokazu, to Tokai Rubber Industries, Ltd. Quick connector. 5,181,751, Cl. 285-39.000.
Kitamura, Shigehiro; Watanabe, Hiroshi; and Abe, Takao, to Konica Corporation. Thermal-transfer recording medium. 5,182,160, Cl. 428-195.000.
Kitasato Institute, The: *See*—
Tamura, Shinichi; Kurata, Takeshi; Aizawa, Chikara; and Nagamine, Takashi, 5,182,109, Cl. 424-92.000.
Kitoh, Hidenori, to Kabushiki Kaisha Komatsu Seisakusho. Turning brake controlling system for use in power shovel. 5,182,713, Cl. 364-424.010.
Kiyama, Masaaki: *See*—
Sato, Toshihiro; Kiyama, Masaaki; Harita, Yasuhiro; and Ozone, Osamu, 5,181,838, Cl. 417-360.000.
Kiyomura, Yoshihiro: *See*—
Kinaga, Yoshimasa; Ogawa, Masao; and Kiyomura, Yoshihiro, 5,182,786, Cl. 385-128.000.
Kizu, Sojiro; Saito, Yutaka; Ninomiya, Ichiro; and Sasho, Hidehiko, to Sony Corporation. Editing system and method of editing wherein a common scene is recorded asynchronously different media. 5,182,677, Cl. 360-14.200.
Klak, Roland: *See*—
Schmid, Friedrich; Joppig, Peter; and Klak, Roland, 5,182,437, Cl. 219-270.000.
Klatt, Karl-Heinz: *See*—
Chakraborty, Amiya K.; Rohde, Jurgen; Klatt, Karl-Heinz; Wenzl, Helmut; and Konrad, Ralf, 5,181,845, Cl. 431-7.000.
Klausener, Alexander: *See*—
Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hanssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,182,286, Cl. 514-256.000.
Klein, David C.; Korf, Horst W.; and Bruce, Jeffrey N., to United States of America, Health and Human Services. Screening test for pineocytoma. 5,182,215, Cl. 436-514.000.
Klein, Keith W., to General Electric Company. Thermal-magnetic trip unit. 5,182,532, Cl. 335-35.000.
Kleinert, Hollis D., to Abbott Laboratories. Method for treating renal disease. 5,182,266, Cl. 514-18.000.
Kline, Ronald A., to University of Oklahoma, Board of Regents of the. Automatic monitoring of composite prepregs. 5,181,421, Cl. 73-597.000.
Klueppel, Hans-Juergen: *See*—
Wuelknitz, Peter; Lehmann, Rudolf; and Klueppel, Hans-Juergen, 5,182,101, Cl. 424-54.000.
Klueppel, Hans-Juregen; and Fabry, Bernd, to Henkel Kommandigesellschaft auf Aktien. Plaque-inhibiting oral and dental care preparations. 5,182,100, Cl. 424-49.000.
Knafelc, Frank: *See*—
Theys, Ezra; Taylor, Russell G.; Bertelsen, Bruce; Oey, Albert; Hoyrup, John; and Knafelc, Frank, 5,181,456, Cl. 99-485.000.
Knapp, James H.; and Nelson, Keith E., to Motorola, Inc. Method of molding a carrier ring to leads. 5,182,071, Cl. 264-272.130.
Kneer, Franz X., to Gebruder Weiss K.G. Process for compositing organic waste and installation for implementing the process. 5,181,950, Cl. 71-9.000.
Kobayashi, Chie: *See*—
Itoh, Masaaki; Matsushima, Hiroaki; Kogure, Hiroshi; Shizuya, Mitsutaka; and Kobayashi, Chie, 5,181,392, Cl. 62-160.000.
Kobayashi, Ryoichi: *See*—
Izawa, Katsuyoshi; Kobayashi, Ryoichi; and Ozawa, Masayuki, 5,182,628, Cl. 257-707.000.
Kobayashi, Seiji: *See*—
Arai, Hideto; and Kobayashi, Seiji, 5,181,870, Cl. 440-77.000.
Kobayashi, Shinichi: *See*—
Andoh, Nobuaki; Kohda, Kenji; Toyama, Tsuyoshi; Noguchi, Kenji; and Kobayashi, Shinichi, 5,182,725, Cl. 365-185.000.
Kobayashi, Takaichi; Shibasaki, Kazuka; Hosoi, Takashi; Honda, Masami; and Takahashi, Kazuyoshi, to Kabushiki Kaisha Toshiba; and Kel Corporation. Function expanding apparatus for compact electronic device. 5,182,698, Cl. 361-395.000.
Kobayashi, Takaichi; and Yoshida, Mitsuhiro, to Kabushiki Kaisha Toshiba. Portable electronic apparatus having an interchangeable detachable battery and optional component for expanding a function. 5,182,699, Cl. 361-395.000.
Kobayashi, Yoshiko: *See*—
Tomiyasu, Hiroshi; Kobayashi, Yoshiko; Goto, Kiyoshi; Yamamoto, Takeshi; and Nakai, Hideyuki, 5,182,183, Cl. 430-165.000.
Koch, Rolf: *See*—
Hessel, Joachim; Koch, Rolf; and Sturm, Wolfgang, 5,181,746, Cl. 285-3.000.
Koch, Rudolf; and Streicher, Robert M., to Sulzer Brothers Limited. Bone implant having relatively slidable members. 5,181,926, Cl. 623-22.000.
Koch, Rudolf: *See*—
Gschwend, Norbert; and Koch, Rudolf, 5,181,924, Cl. 623-20.000.
Kocher, Haribhajan S.: *See*—
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul M., 5,181,329, Cl. 34-156.000.
Kockler, Barry C.: *See*—
Campbell, Kenneth C.; Gray, Roger M.; and Kockler, Barry C., 5,182,687, Cl. 360-92.000.
Koenig & Bauer Aktiengesellschaft: *See*—
Barrois, Claus D.; and Dieterich, Philipp A., 5,181,470, Cl. 101-425.000.
Koester, Klaus: *See*—
Bauer, Volker; Raehse, Wilfried; Koester, Klaus; and Jacobs, Jochen, 5,182,054, Cl. 264-15.000.
Koga, Keiji; Satoh, Jun-ichi; Yokoyama, Kenji; Nisizawa, Akinori; and Tokuoka, Yasumichi, to TDK Corporation. Magnetic disk. 5,182,693, Cl. 360-135.000.
Kogawa, Kiyonori: *See*—
Miyashita, Akimi; Fujii, Mutsumasa; Kubosawa, Minoru; Torii, Keiichiro; Ooki, Nobuaki; Kogawa, Kiyonori; Kawaguchi, Masami; Murooka, Hideyasu; and Kyooi, Masayuki, 5,182,121, Cl. 425-338.000.
Kogure, Hiroshi: *See*—
Itoh, Masaaki; Matsushima, Hiroaki; Kogure, Hiroshi; Shizuya, Mitsutaka; and Kobayashi, Chie, 5,181,392, Cl. 62-160.000.
Kohashi, Takashi: *See*—
Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; Kato, Funiaki; and Hirota, Katsuaki, 5,182,636, Cl. 358-41.000.
Kohda, Kenji: *See*—
Andoh, Nobuaki; Kohda, Kenji; Toyama, Tsuyoshi; Noguchi, Kenji; and Kobayashi, Shinichi, 5,182,725, Cl. 365-185.000.

Kohler, Gregory R., to Andritz Sprout-Bauer, Inc. Grinding plate with angled outer bars. 5,181,664, Cl. 241-261.300.
Kohno, Takeshi, to Horiba, Ltd. Flow-through type hydrogen peroxide electrode. 5,182,004, Cl. 204-409.000.
Kohout, Jirj: *See*—
Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , 5,182,285, Cl. 514-255.000.
Koishi, Masumi: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.
Koiwa, Mitsuru; and Morita, Shingo, to Mitsubishi Denki Kabushiki Kaisha. Ignition apparatus for an internal combustion engine. 5,181,498, Cl. 123-633.000.
Koizumi, Yoshiaki; Tsujita, Kenji; Kouno, Shigenori; and Ohmura, Ken, to Konica Corporation. Resin coated carriers for electrostatic image development and the method of preparing the same. 5,182,181, Cl. 430-108.000.
Kojima, Atsushi: *See*—
Jutamulia, Suganda; Fujita, Akihiro; Toyoda, Shinji; Kojima, Atsushi; and Ito, Eiichi, 5,182,639, Cl. 358-81.000.
Kojima, Keiji: *See*—
Nakayama, Hiroshi; Kojima, Keiji; and Sato, Gen, 5,182,777, Cl. 382-18.000.
Kojima, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Air/fuel ratio control apparatus in an internal combustion engine. 5,181,496, Cl. 123-493.000.
Kokubun, Hitoshi, to Nissan Motor Co., Ltd. Structure for mounting suspension unit on vehicle body. 5,181,736, Cl. 280-719.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Sakata, Shigekazu; Ito, Yasuo; Ochiai, Kunio; and Yamagata, Hisao, 5,182,748, Cl. 370-94.100.
Kolada, Paul P., to American Standard Inc. Web protection system for double sinks. 5,181,285, Cl. 4-657.000.
Komatani, Masaki: *See*—
Nagamune, Akio; Tezuka, Kouichi; Komine, Isamu; Kuriyama, Shinji; Komatani, Masaki; and Inoue, Akihiko, 5,182,565, Cl. 342-124.000.
Komatsubara, Michiro; Kurosawa, Mitsumasa; Hayakawa, Yasuyuki; Iida, Yoshiaki; and Sadayori, Toshio, to Kawasaki Steel Corporation. Process for producing grain oriented silicon steel sheets having excellent magnetic properties. 5,181,972, Cl. 148-111.000.
Komatsubara, Toshio; Tagata, Tsutomu; and Matsuo, Mamoru, to Sky Aluminum Co., Ltd. Rolled aluminum alloy adapted for superplastic forming and method for making. 5,181,969, Cl. 148-552.000.
Komine, Isamu: *See*—
Nagamune, Akio; Tezuka, Kouichi; Komine, Isamu; Kuriyama, Shinji; Komatani, Masaki; and Inoue, Akihiko, 5,182,565, Cl. 342-124.000.
Komori, Shinji: *See*—
Tamura, Toshiyuki; Fujita, Masaki; Komori, Shinji; Sato, Hisakazu; and Takata, Hidehiro, 5,182,799, Cl. 395-400.000.
Komura, Kazumasa: *See*—
Matsushita, Yoshiharu; and Komura, Kazumasa, 5,181,497, Cl. 123-520.000.
Kondo, Hiroshi: *See*—
Tanigawa, Hiroshi; Kondo, Hiroshi; Fukai, Isao; and Tohyama, Tsuneo, 5,182,522, Cl. 328-167.000.
Kondo, Kazuhiko: *See*—
Iwasaki, Tameo; Kondo, Kazuhiko; Matsuoka, Yuzo; Matsumoto, Mamoru; and Sugiura, Masaki, 5,182,404, Cl. 548-237.000.
Kondo, Toshiharu: *See*—
Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; Kato, Funiaki; and Hirota, Katsuaki, 5,182,636, Cl. 358-41.000.
Kondoh, Hisao: *See*—
Akiyama, Hajime; and Kondoh, Hisao, 5,182,626, Cl. 257-142.000.
Konica Corporation: *See*—
Fukuchi, Masakazu; Morita, Shizuo; Haneda, Satoshi; Satoh, Hisao; and Ikeda, Tadayoshi, 5,182,595, Cl. 355-200.000.
Kakita, Akihiko; Sugizaki, Tsugio; and Fujii, Yozo, 5,182,602, Cl. 355-271.000.
Kitamura, Shigehiro; Watanabe, Hiroshi; and Abe, Takao, 5,182,160, Cl. 428-195.000.
Koizumi, Yoshiaki; Tsujita, Kenji; Kouno, Shigenori; and Ohmura, Ken, 5,182,181, Cl. 430-108.000.
Tomiyasu, Hiroshi; Kobayashi, Yoshiko; Goto, Kiyoshi; Yamamoto, Takeshi; and Nakai, Hideyuki, 5,182,183, Cl. 430-165.000.
Konings, Leonardus U. E.: *See*—
Denneman, Jan W.; and Konings, Leonardus U. E., 5,182,503, Cl. 315-224.000.
Konishi, Kazuki: *See*—
Suda, Yasuo; Nagano, Akihiko; and Konishi, Kazuki, 5,182,443, Cl. 250-201.200.
Konrad, Ralf: *See*—
Chakraborty, Amiya K.; Rohde, Jurgen; Klatt, Karl-Heinz; Wenzl, Helmut; and Konrad, Ralf, 5,181,845, Cl. 431-7.000.
Konushi, Fumihiro: *See*—
Taneya, Mototaka; Konushi, Fumihiro; Okumura, Toshiyuki; and Takiguchi, Haruhisa, 5,182,758, Cl. 372-46.000.
Koo, Horng-Show: *See*—
Chen, Hsing; Koo, Horng-Show; Chang, Li; and Shieh, K. L., 5,181,528, Cl. 131-256.000.
Koo, Vincent H., to Maxpat Trading & Marketing (Far West) Limited. Can openers. 5,181,322, Cl. 30-416.000.
Kooi, Rick F. Controlled dispenser. 5,181,533, Cl. 137-268.000.
Koontz, Harry S.; and Forr, John P., to PPG Industries, Inc. Electrically heated window. 5,182,431, Cl. 219-203.000.
Kopolow, Stephen L.; Tazi, Mohammed; and Walls, Edward W., Jr., to ISP Investments Inc. Terpolymer hair fixatives, aqueous solution process for making same and water-based hair spray formulations which meet VOC standards. 5,182,098, Cl. 424-47.000.
Koprowski, Hilary: *See*—
Steplewski, Zenon; Koprowski, Hilary; and Thurin, Magdalena, 5,182,192, Cl. 435-7.230.
Korbova, Libuse: *See*—
Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , 5,182,285, Cl. 514-255.000.
Korf, Horst W.: *See*—
Klein, David C.; Korf, Horst W.; and Bruce, Jeffrey N., 5,182,215, Cl. 436-514.000.
Koshida, Hitoshi: *See*—
Takuma, Keisuke; Ohyama, Tsukasa; Igata, Akitoshi; Mikoda, Tamio; Ghoda, Isamu; and Koshida, Hitoshi, 5,182,395, Cl. 552-251.000.
Koshikawa, Nobuo; and Inoue, Masahiro, to Kabushiki Kaisha Machida Seisakusho. Endoscope and jig for processing signal conductors of endoscope. 5,181,545, Cl. 140-92.100.
Koshoffer, John M.: *See*—
Napoli, Phillip D.; and Koshoffer, John M., 5,181,377, Cl. 60-39.310.
Kotani, Kunio: *See*—
Tsukada, Kiroku; and Kotani, Kunio, 5,182,072, Cl. 264-349.000.
Koumoto, Yasuhiko; and Maemura, Koji, to NEC Corporation. Microprocessor having improved functional redundancy monitor mode arrangement. 5,182,754, Cl. 371-68.300.
Kouno, Shigenori: *See*—
Koizumi, Yoshiaki; Tsujita, Kenji; Kouno, Shigenori; and Ohmura, Ken, 5,182,181, Cl. 430-108.000.
Kouno, Takefumi: *See*—
Uemura, Seiichi; Sohda, Yoshio; Kato, Osamu; Kouno, Takefumi; and Kihara, Tsutomu, 5,181,979, Cl. 156-89.000.
Kovack, Eugene S.: *See*—
Bajorek, Jay E.; Cox, Austin E.; Kovack, Eugene S.; Lionetti, Michael S.; and Smisko, Joe, 5,182,541, Cl. 340-428.000.
Kovalsky, Lev, to Tridon Limited. Apparatus for simultaneous measurement of radial forces in a ring-like clamp. 5,181,426, Cl. 73-862.541.
Kowalski, John A.: *See*—
Andrews, Howard W., Jr.; Kowalski, John A.; and Wahl, Friedrich G., 5,181,297, Cl. 24-336.000.
Koyama, Takeshi: *See*—
Tanisake, Hiroka; Koyama, Takeshi; and Isozaki, Tsuyoshi, 5,182,392, Cl. 548-520.000.
Koyfman, Ilya: *See*—
Chesterfield, Michael P.; Koyfman, Ilya; and Hain, Matthew E., 5,181,923, Cl. 606-228.000.
Kozakura, Nobuto: *See*—
Maruyama, Masao; Kozakura, Nobuto; and Nakakubo, Katsuya, 5,181,889, Cl. 474-110.000.
Kozlowski, Lawrence J.; and Shirey, Lawrence A., to United States of America, Energy. Lockout device for high voltage circuit breaker. 5,181,602, Cl. 200-43.015.
Kozma, Jess A.: *See*—
Kapp, David C.; Boston, Russell E.; Carlblom, Leland H.; McKinley, Mildred L.; and Kozma, Jess A., 5,182,148, Cl. 428-34.600.
Kraft General Foods Canada Inc.: *See*—
Laplace, Christian, 5,182,128, Cl. 426-410.000.
Krakowiak, Krzysztof E.: *See*—
Bruening, Ronald L.; Tarbet, Bryon J.; Bradshaw, Jerald S.; Izatt, Reed M.; and Krakowiak, Krzysztof E., 5,182,251, Cl. 502-401.000.
Kramers, S. Dirk: *See*—
Harken, Olaf T.; Hall, Eric R. D.; and Kramers, S. Dirk, 5,181,477, Cl. 114-39.100.
Krause, James N.; Tremaine, Brian P.; and Chan, Litko R., to Seagate Technology, Inc. Stepper motor torque variance compensation using varied applied voltage. 5,182,685, Cl. 360-78.130.
Kreibich, Rainer: *See*—
Viebach, Thomas; Kreibich, Rainer; Nuber, Bernd; Pauker, Robert; and Hesse, Alexander, 5,181,512, Cl. 128-660.030.
Kreischer, Charles H.: *See*—
Beltran, Adrian M.; and Kreischer, Charles H., 5,182,080, Cl. 420-588.000.
Krejci, Ivan: *See*—
Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , 5,182,285, Cl. 514-255.000.
Krepelka, Jiri : *See*—
Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , 5,182,285, Cl. 514-255.000.

Krespan, Carl G.: *See*—
Feiring, Andrew E.; Krespan, Carl G.; Resnick, Paul R.; Smart, Bruce E.; Treat, Theodore A.; and Wheland, Robert C., 5,182,342, Cl. 526-206.000.
Krishnan, Lalitha: *See*—
Tobkes, Martin; Diaz, Simon; and Krishnan, Lalitha, 5,182,374, Cl. 536-16.500.
Krismer, Bruno E.; and Nietfeld, Georg, to Hermann C. Starck Berlin GmbH & Co. Cobalt-bound diamond tools, a process for their manufacture and their use. 5,181,938, Cl. 51-293.000.
Kroll, Arthur S.; Dunn, Arthur E.; DeCecca, Michael L.; Gaudino, David M.; Livadas, Jerry E.; Fairport, David R.; and Rydelek, James G., to Eastman Kodak Company. Method and apparatus for applying toner to an electrostatic image. 5,182,608, Cl. 355-326.000.
Krueger, Michael K.: *See*—
Krueger, Robert A.; and Krueger, Michael K., 5,181,354, Cl. 52-79.100.
Krueger, Robert A.; and Krueger, Michael K., to Tri-Mark Metal Corporation. Barrier panel. 5,181,354, Cl. 52-79.100.
Krutsch, John R.; and Jayswal, Manu, to William Electronics Games, Inc. Movable optical target bank for a rolling ball game. 5,181,722, Cl. 273-127.00B.
Kuberasampath, Thangavel: *See*—
Oppermann, Hermann; Kuberasampath, Thangavel; Rueger, David C.; and Ozkaynak, Engin, 5,182,365, Cl. 530-326.000.
Kubo, Reiko: *See*—
Ishizuka, Hitoharu; and Kubo, Reiko, 5,182,064, Cl. 264-137.000.
Kubosawa, Minoru: *See*—
Miyashita, Akimi; Fujii, Mutsumasa; Kubosawa, Minoru; Torii, Keiichiro; Ooki, Nobuaki; Kogawa, Kiyonori; Kawaguchi, Masami; Murooka, Hideyasu; and Kyooi, Masayuki, 5,182,121, Cl. 425-338.000.
Kudo, Akira: *See*—
Bauer, Steven R.; Kudo, Akira; Melchers, Georg F.; and Sakaguchi, Nobuo, 5,182,205, Cl. 435-240.200.
Kudo, Tomohiro: *See*—
Ohkoda, Keiji; Kudo, Tomohiro; Shimizu, Satoshi; and Kawasaki, Keiichi, 5,181,715, Cl. 271-272.000.
Kuge, Toru: *See*—
Ishii, Takaaki; and Kuge, Toru, 5,182,765, Cl. 379-88.000.
Kuhl, Daniel C.: *See*—
Farrell, Joseph K.; Gordon, Jeffrey S.; Kuhl, Daniel C.; and Lee, Timothy V., 5,182,800, Cl. 395-425.000.
Kuhlman, Marvin G.; Finkiewicz, Daniel J.; and Gradecki, Raymond J., to NCM International, Inc. Unitary paper impression device. 5,181,464, Cl. 101-28.000.
Kuhlmann, Erven J.; Pascoe, James R.; Browne, James E.; and Martin, Kevin J., to Texaco Inc. Sulfated catalyst for skeletal isomerization of olefins. 5,182,247, Cl. 502-217.000.
Kukla, Reiner: *See*—
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Khan, Muhammad A.; Kuznia, Jonathon N.; and Van Hove, James M., 5,182,670, Cl. 359-359.000.
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Sagawa, Seiji; Kano, Toshio; Yachigo, Shinichi; and Ida, Kanako, 5,182,390, Cl. 544-222.000.
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Miyashita, Akimi; Fujii, Mutsumasa; Kubosawa, Minoru; Torii, Keiichiro; Ooki, Nobuaki; Kogawa, Kiyonori; Kawaguchi, Masami; Murooka, Hideyasu; and Kyooi, Masayuki, 5,182,121, Cl. 425-338.000.
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Leondaridis, Paul; Vendel, Albert S.; and Akthar, Tarranum, 5,182,088, Cl. 423-210.000.

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Lapeyre, James M., deceased; Greve, Christopher; and O'Connor, Ronald M., 5,181,879, Cl. 452-160.000.

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Lan, Ching-Hwei. Non-polluting firecracker device. 5,181,775, Cl. 362-234.000.

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Langston, Mark A. Protein absorbing aquarium filter element and method. 5,182,018, Cl. 210-282.000.

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Ayers, Richard C.; and Wilson, Thomas G., 5,181,561, Cl. 165-162.000.

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Weber, Jurgen; Lappe, Peter; and Springer, Helmut, 5,182,400, Cl. 546-250.000.

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Keys, James F.; and Larsen, Douglas C., 5,181,341, Cl. 49-477.000.

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Larson, Randall; and Larson, Gloria A., 5,181,895, Cl. 482-93.000.

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Dantono, David F.; and LaTremouille, Darrell F., 5,181,869, Cl. 440-53.000.

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Hill, Alan M.; and Meeks, William R., 5,181,899, Cl. 493-34.000.

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Bagrodia, Shriram; Fagerburg, David R.; Watkins, Joseph J.; and Lawrence, Paul B., 5,182,345, Cl. 525-462.000.

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Leach, Christopher B., deceased; and Kaines, John L., 5,181,363, Cl. 52-685.000.

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Slotkowski, Kenneth G.; Michaels, Paul A.; Macks, Harold R.; and Ewald, Henry J., 5,182,502, Cl. 315-159.000.

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Lee, Albert, to Alberee Ltd., Inc. Plastic oil filter assembly. 5,182,015, Cl. 210-94.000.

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Chen, Ching-Ming; and Lee, Cheng-Fu, 5,181,876, Cl. 446-47.000.

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Ker, Ming-Dou; Lee, Chung-Yuan; and Wu, Chung-Yu, 5,182,220, Cl. 437-34.000.

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Lee, J. Kelly; Reznik, Svetlana; and Regelsberger, Matthias H., to Eastman Kodak Company. Responder target for theft detection apparatus. 5,182,062, Cl. 264-129.000.

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Borys, Tadeusz; Lee, Shueh-Mo; and Wakefield, Earlby E. J., 5,182,141, Cl. 427-379.000.

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Le Gigan, Dominique, to Star Partners. Grain processor. 5,181,616, Cl. 209-31.000.

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Spector, Marshall L., 5,182,021, Cl. 210-605.000.

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Wuelknitz, Peter; Lehmann, Rudolf; and Klueppel, Hans-Juergen, 5,182,101, Cl. 424-54.000.

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Leicht, Helmut W. Method and apparatus for vapor phase soldering and cleaning products. 5,181,648, Cl. 228-201.000.

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Labbe, Donald E.; Line, Lawrence J.; Geary, Christopher T.; Leigh, Mark C.; and Donohue, John M., 5,181,482, Cl. 122-392.000.

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Heyes, Peter J.; Leishman, Ian M.; and Pope, Kevin J., 5,181,409, Cl. 72-46.000.

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Jordens, Ernst-Gunter; and Siemer, Hubert, 5,181,784, Cl. 384-222.000.

Lemon, Francis W.: *See*—
Elias, Lorne; Lawrence, Andre H.; and Lemon, Francis W., 5,181,427, Cl. 73-863.120.

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Pesheck, Peter S.; and Lentz, Ronald R., 5,182,425, Cl. 219-10.55E.

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Scheuchzer, Antoine P., 5,181,472, Cl. 104-2.000.

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Piotrowski, Stanley; and Levine, Ronald I., 5,182,065, Cl. 264-153.000.

Leviton Manufacturing Company, Inc.: *See—*
Josephson, Arnold, 5,181,310, Cl. 29-517.000.

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Flotow, Richard A.; and Lewis, J. Michael, 5,181,593, Cl. 192-30.00W.

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Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.

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Nonnenmacher, Ronald C.; Schulz, Kathleen; Lewis, Richard C.; and Riley, Richard, 5,181,313, Cl. 29-620.000.

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Fritsche, Wolf E.; Lubbehusen, Michael; Kukla, Reiner; and Beißwenger, Siegfried, 5,182,001, Cl. 204-192.120.
Maass, Wolfram; and Patz, Ulrich, 5,182,003, Cl. 204-298.230.

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Liang, Bob C.-C.; Liang, Nina Y.; Phelps, Michael J.; and Tannenbaum, David C., 5,182,797, Cl. 395-160.000.

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Yeh, Tse-Huei; Tsai, Song-Jau; Lin, Chang-Tsun; Liao, Long-Gee; and Huang, Tsai-Sheng, 5,181,408, Cl. 72-11.000.

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Liebel, Henry L. Corner post having laminated paperboard spine. 5,181,611, Cl. 206-453.000.

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Lien, Wei M. Ping-pong ball shooter. 5,181,501, Cl. 124-10.000.

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Ruff, Klaus; Falk, Bernhard; and Liesching, Detlef, 5,182,095, Cl. 423-659.000.

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Asteljoki, Jussi A.; Laulumaa, Jukka F.; and Lilja, Launo L., 5,181,955, Cl. 75-443.000.

Lill, Melvin H., to FMC Corporation. Two-dimensional profile detection system. 5,182,614, Cl. 356-376.000.

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Daenen, Robert H. C. M.; Lillelund, Stig; Kato, Masao; Lonergan, Peter; and Picozza, Augusto A., 5,181,626, Cl. 220-282.000.

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Muller, Manfred K., 5,182,538, Cl. 337-102.000.

Limouzin, Dominique: *See—*
de Seroux, Nicolas; and Limouzin, Dominique, 5,182,076, Cl. 376-250.000.

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Merritt, Alfred R.; Cooke, Theodore M.; Lin, An-Chung R.; and Whitfield, Richard G., 5,182,572, Cl. 346-1.100.

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Yeh, Tse-Huei; Tsai, Song-Jau; Lin, Chang-Tsun; Liao, Long-Gee; and Huang, Tsai-Sheng, 5,181,408, Cl. 72-11.000.

Lin, Joel Y.: *See—*
Norman, Thomas J., Jr.; Ingram, James R., Jr.; and Lin, Joel Y., 5,181,788, Cl. 400-232.000.

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Brock, Andrew J.; Lin, Lifun; Menkin, Paul; and Polan, Ned W., 5,181,770, Cl. 205-77.000.

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Mosquera, Rene A.; and Lin, Michael A., 5,181,855, Cl. 439-74.000.

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Dumbleton, John H.; Lin, Ruey Y.; Stark, Casper F.; and Crippen, Thomas E., 5,181,930, Cl. 623-23.000.

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Antonelli, Joseph A.; Lin, Tyau-Jeen; Yang, Duck J.; and Yasuda, Hirotsugu, 5,182,000, Cl. 204-181.100.

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Sherman, Randy J.; Weilbach, August O.; Hanson, Derald F.; and Smith, C. Dwight, 5,181,783, Cl. 384-114.000.

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Linden, Tom H.; Passaglia, Dick; and Taccolini, Ray, to Crown Bolt, Inc. Display shelf adapter. 5,181,623, Cl. 211-183.000.

Lindenmeyer, Carl W., to Universities Research Association, Inc. Apparatus and method for loading and unloading multiple digital tape cassettes utilizing a removable magazine. 5,182,686, Cl. 360-92.000.

Lindgren, Claes; Moller, Brent; Petersen, Flemming O.; and Vigenberg, Stig F., to V. Kann Rasmussen Industri A/S. Window with a main frame for installation in an inclined roof and two openable window frames. 5,181,340, Cl. 49-371.000.

Lindley, John D.; Mackenzie, Colin R.; and Hall, Mark E., to Weatherford-Petco, Inc. Milling tool. 5,181,564, Cl. 166-55.600.

Line, Lawrence J.: *See—*
Labbe, Donald E.; Line, Lawrence J.; Geary, Christopher T.; Leigh, Mark C.; and Donohue, John M., 5,181,482, Cl. 122-392.000.

Linear Technology Corporation: *See—*
Nelson, Carl; and Wang, Jia-Tarng, 5,182,219, Cl. 437-27.000.
Nelson, Carl T., 5,182,526, Cl. 330-257.000.

Linemeyer, David L.: *See—*
Helms, Gregory L.; Horn, Wendy S.; Jones, E. Tracy T.; and Linemeyer, David L., 5,182,298, Cl. 514-455.000.

Ling, Nicholas C. K.; Ueno, Naoto; Shimasaki, Shunichi; Esch, Frederick S.; Ying, Shao-Yao; and Guillemin, Roger C. L., to Salk Institute for Biological Studies, The. DNA encoding follistatin. 5,182,375, Cl. 536-23.500.

Lion Corporation: *See—*
Yanaba, Shigeru; Shiobara, Masataka; Masamizu, Koji; Morohara, Kiyoshi; and Abe, Seiji, 5,182,044, Cl. 252-174.240.

Lionetti, Michael S.: *See—*
Bajorek, Jay E.; Cox, Austin E.; Kovack, Eugene S.; Lionetti, Michael S.; and Smisko, Joe, 5,182,541, Cl. 340-428.000.

Lipski, Christopher J.: *See—*
Cote, Pierre L.; Maurion, Roger P.; Lipski, Christopher J.; and Pedersen, Steven K., 5,182,019, Cl. 210-321.800.

Lir France (S.A.): *See—*
Petit, Robert, 5,181,624, Cl. 215-330.000.

Lisco, Inc.: *See—*
Glover, Richard W., 5,181,765, Cl. 297-467.000.
Meeker, Paul K., 5,181,761, Cl. 297-250.000.

Lisec, Peter. Apparatus bending hollow profiles into spacer frames for insulating glass. 5,181,412, Cl. 72-307.000.

Littau, Eugene G. Harvester with moving guide. 5,181,373, Cl. 56-329.000.

Little, Frank F.: *See—*
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.

Little, Wendell L.: *See—*
Bartling, James E.; Little, Wendell L.; and Deierling, Kevin E., 5,182,810, Cl. 395-750.000.

Liu, Yuan W. Compact collapsible lunch box. 5,181,612, Cl. 206-546.000.

Liu, Yung S.: *See—*
Cole, Herbert S., Jr.; Rose, James W.; Guida, Renato; and Liu, Yung S., 5,182,188, Cl. 430-323.000.

Livadas, Jerry E.: *See—*
Kroll, Arthur S.; Dunn, Arthur E.; DeCecca, Michael L.; Gaudino, David M.; Livadas, Jerry E.; Fairport, David R.; and Rydelek, James G., 5,182,608, Cl. 355-326.000.

Livingston, Dwight: *See—*
Monthony, James F.; Livingston, Dwight; Reuben, Jayakumar; and Tite, Robert C., 5,182,082, Cl. 422-57.000.

Livingston, Troy W., to Ryeson Corporation. Apparatus and method for testing torque wrenches. 5,181,425, Cl. 73-862.080.

Lloyd, Christopher. Drug information request system. 5,181,743, Cl. 283-48.100.

Lo, Tsai: *See—*
Munich, Randy; Ewing, David; Lo, Tsai; Sheldrick, Wayne; and Chieh, Baldwin, 5,182,771, Cl. 380-5.000.

Locatelli, Renato: *See—*
Bertelli, Guido; Cicchetti, Osvaldo; Goberti, Paolo; and Locatelli, Renato, 5,182,321, Cl. 524-100.000.

Lockheed Corporation: *See—*
Griggs, R. Lamar; and Hatton, Norman E., 5,181,808, Cl. 408-1.00R.

Lockwood, Dean H.: *See—*
Schmidt, William G.; Lockwood, Dean H.; and Carter, Jeffrey D., 5,182,125, Cl. 426-68.000.

Loctite Corporation: *See—*
Chu, Hsien-Kun; Cross, Robert P.; and Crossan, David I., 5,182,315, Cl. 522-37.000.
Jacobine, Anthony F.; and Nakos, Steven T., 5,182,360, Cl. 528-205.000.

Loeding, Neil W.: *See*—
Tran, Nang T.; Loeding, Neil W.; and Nins, David V., 5,182,624, Cl. 257-40.000.

Loffler, Gerhard: *See*—
Kipphan, Helmut; Loffler, Gerhard; Keller, Guido; and Ott, Hans, 5,182,721, Cl. 364-526.000.

Lohmeijer, Johannus H. G. M.: *See*—
Claesen, Christianus A.; Lohmeijer, Johannus H. G. M.; Boogers, Michael P. J.; Bussink, Jan; Savenije, Hermannus B.; Hoeks, Theodorus L.; and Gosens, Johannes C., 5,182,325, Cl. 524-404.000.

Lokring Corporation: *See*—
Benson, Robert W.; Beiley, Mark J.; Sareshwala, Sohel A.; Croft, Steven T.; and Vaughn, Jack M., 5,181,752, Cl. 285-81.000.

Lomas, David A.; Haun, Edward C.; and Sechrist, Paul A., to UOP. Vented riser apparatus and method. 5,182,085, Cl. 422-144.000.

Lonergan, Peter: *See*—
Daenen, Robert H. C. M.; Lillelund, Stig; Kato, Masao; Lonergan, Peter; and Picozza, Augusto A., 5,181,626, Cl. 220-282.000.

Long, Jerry A.: *See*—
Dambach, Philip J.; Long, Jerry A.; and Sampson, Stephen A., 5,181,852, Cl. 439-52.000.

Long, Joseph: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Long Manufacturing Limited: *See*—
Argyle, Charles S.; Cheadle, Brian E.; and Bokor, Steven L. M., 5,181,536, Cl. 137-559.000.

Longman, Douglas E.: *See*—
Ausman, Thomas G.; Longman, Douglas E.; and Stockner, Alan R., 5,181,494, Cl. 123-446.000.

Lonhoff, Norbert; Schmidt, Ludwig; Block, Hans-Dieter; and Weber, Rainer, to Bayer Aktiengesellschaft. Process for the preparation of chromic acid. 5,181,994, Cl. 204-97.000.

Lonza Ltd.: *See*—
Kiener, Andreas; Glockler, Rainer; and Heinzmann, Klaus, 5,182,197, Cl. 435-122.000.

Look S.A.: *See*—
Bezin, Michel; and Raemdonck, Joris V., 5,181,732, Cl. 280-279.000.

Loral Aerospace Corp.: *See*—
Kelly, Larry R.; and Waugh, Geoffrey S., 5,182,530, Cl. 333-18.000.

Lord Corporation: *See*—
Holmes-Farley, Stephen R.; and Yanyo, Lynn C., 5,182,143, Cl. 427-409.000.

L'Oreal: *See*—
Sebag, Henri, 5,182,407, Cl. 554-52.000.

Lorenz, Gary V. Extensible lifting tower with hydraulic cylinders in series. 5,181,693, Cl. 254-2.00R.

Lott, Gene. Refrigerated waste container with germicidal lamp. 5,181,393, Cl. 62-264.000.

Louris, John N.: *See*—
Schwartz, Jae C.; Syka, John E. P.; and Louris, John N., 5,182,451, Cl. 250-282.000.

LRC Electronics, Inc.: *See*—
Gaver, Joseph C., Jr.; and Jorgenson, James C., 5,181,861, Cl. 439-578.000.

LTV Aerospace and Defense Company: *See*—
D'Agostino, William L.; Barrick, Michael D.; and Williams, Glen R., 5,182,779, Cl. 385-13.000.

Lu, Richard M. T.: *See*—
Nickolls, Peter; Lu, Richard M. T.; Collins, Kenneth A.; McCulloch, Roy M.; Cheatle, Lucy M.; and Cleland, Brian, 5,181,511, Cl. 128-419.0PG.

Lubbehusen, Michael: *See*—
Fritsche, Wolf E.; Lubbehusen, Michael; Kukla, Reiner; and BeiBwenger, Siegfried, 5,182,001, Cl. 204-192.120.

Lubrizol Corporation, The: *See*—
Pialet, Joseph W.; Scharf, Curtis R.; and DiBiase, Stephen A., 5,182,037, Cl. 252-47.500.

Lubrizol Genetics, Inc.: *See*—
Slightom, Jerry L.; and Tepfer, David A., 5,182,200, Cl. 435-172.300.

Lucas, Marthe. Display and applicator container for waxy products. 5,181,790, Cl. 401-75.000.

Lucchetti, Jean: *See*—
Gubin, Jean; Chatelain, Pierre; Descamps, Marcel; Nisato, Dino; Inion, Henri; Lucchetti, Jean; Mahaux, Jean-Marie; and Vallat, Jean-Noel, 5,182,291, Cl. 514-300.000.

Luciani, Pierre; Deves, Philippe; and Tallibert, Patrick, to Dassault Electronique. Device for testing a network of components, in particular an electronic circuit. 5,182,717, Cl. 364-481.000.

Lunger, Brooks S.: *See*—
Bartlett, Philip L.; Bivens, Donald B.; Lunger, Brooks S.; and Yokozeki, Akimichi, 5,182,040, Cl. 252-67.000.

Lunsford, Kelvin: *See*—
Medveczky, Geza; and Lunsford, Kelvin, 5,182,770, Cl. 380-4.000.

Lusin, Gary: *See*—
Cook, Gerry; and Lusin, Gary, 5,181,904, Cl. 602-32.000.

Lutz, Rodney A.: *See*—
Pirl, William E.; Smith, Edward H.; Roth, Charles H., Jr.; Lutz, Rodney A.; and Anderson, John J., 5,182,429, Cl. 219-121.630.

Lydtin, Hans; and Clasen, Rolf, to U.S. Philips Corp. Method of manufacturing tubes and device for carrying out the method. 5,182,052, Cl. 264-1.200.

Lyons, John E.; and Magrane, Joseph, to Duro Dyne Corporation. Apparatus for manufacturing air turning assembly. 5,181,314, Cl. 29-796.000.

Lyons, Michael: *See*—
Hall, William W.; Read, Stanley E.; Lyons, Michael; and Zabriskie, John B., 5,182,306, Cl. 514-629.000.

Lyr, Horst: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 5,182,277, Cl. 514-231.200.

M. Glosser & Sons, Inc.: *See*—
Lackner, Raymond F., 5,181,463, Cl. 100-137.000.

Maass, Jurgen: *See*—
Merkel, Gerd; Vogt, Wilfried; Glaunsinger, Georg; Stadler, Peter; Zander, Claus-Peter; Maass, Jurgen; Schmitt, Gernot; Necker, Thomas; and Becker, Willi, 5,181,469, Cl. 101-415.100.

Maass, Wolfram; and Patz, Ulrich, to Leybold Aktiengesellschaft. Stationary magnetron sputtering cathode for a vacuum coating apparatus. 5,182,003, Cl. 204-298.230.

Macha, Emil S.: *See*—
Cooper, Tommy G.; Smith, Ross E.; and Macha, Emil S., 5,182,707, Cl. 364-413.110.

Macheras, James T.: *See*—
Bikson, Benjamin; Macheras, James T.; and Nelson, Joyce K., 5,181,940, Cl. 55-16.000.

Machida, Tohru: *See*—
Makita, Kohzoh; and Machida, Tohru, 5,181,921, Cl. 606-195.000.

Machnich, Christopher: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

MacInnes, David F., Jr.: *See*—
Joyce, James L., Jr.; Jones, Warren C.; Rowlette, John R., Sr.; MacInnes, David F., Jr.; and Vyas, Navin N., 5,182,050, Cl. 252-500.000.

Mackenzie, Colin R.: *See*—
Lindley, John D.; Mackenzie, Colin R.; and Hall, Mark E., 5,181,564, Cl. 166-55.600.

MacKenzie, Kirk J.: *See*—
Faessler, Court; and MacKenzie, Kirk J., 5,181,402, Cl. 70-18.000.

Macks, Harold R.: *See*—
Slotkowski, Kenneth G.; Michaels, Paul A.; Macks, Harold R.; and Ewald, Henry J., 5,182,502, Cl. 315-159.000.

Maclin, Harvey M.: *See*—
Wakeman, Thomas G.; Walker, Alan; and Maclin, Harvey M., 5,181,379, Cl. 60-261.000.

Maeda, Nasaya: *See*—
Shinbori, Kenichi; Maeda, Nasaya; and Sakaegi, Yuji, 5,182,546, Cl. 340-636.000.

Maeda, Shigemi; Deguchi, Toshihisa; and Terashima, Shigeo, to Sharp Kabushiki Kaisha. Optical disk recording/reproducing device utilizing a constant angular velocity method with a constant linear velocity formatted optical disk. 5,182,741, Cl. 369-50.000.

Maemura, Koji: *See*—
Koumoto, Yasuhiko; and Maemura, Koji, 5,182,754, Cl. 371-68.300.

Mafune, Kumiko: *See*—
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.

Magrane, Joseph: *See*—
Lyons, John E.; and Magrane, Joseph, 5,181,314, Cl. 29-796.000.

Mahaux, Jean-Marie: *See*—
Gubin, Jean; Chatelain, Pierre; Descamps, Marcel; Nisato, Dino; Inion, Henri; Lucchetti, Jean; Mahaux, Jean-Marie; and Vallat, Jean-Noel, 5,182,291, Cl. 514-300.000.

Maiellano, Joseph C., Jr.: *See*—
Sklenak, John B.; and Maiellano, Joseph C., Jr., 5,182,426, Cl. 219-10.55F.

Mair-Egg, Harald: *See*—
Ryba, Anton, 5,181,483, Cl. 123-41.120.

Majo, Tommaso: *See*—
Bagnoli, Carlo; Perrella, Guido; and Majo, Tommaso, 5,182,808, Cl. 395-725.000.

Makino, Yosiyuki: *See*—
Tanaka, Tetsukazu; Imai, Masahiro; Ikeda, Hiroshi; and Makino, Yosiyuki, 5,181,398, Cl. 68-12.060.

Makino, Yuji; Matugi, Hideo; and Suzuki, Yoshiki, to Teijin Limited. Stabilized aqueous preparation of active form of vitamin D_3. 5,182,274, Cl. 514-167.000.

Makishima, Reichi, to Nitto Kohki Co., Ltd. Pipe joint apparatus. 5,181,689, Cl. 251-149.600.

Makita, Kohzoh; and Machida, Tohru, to Kaken Co., Ltd. Detachable balloon with two self-sealing valves. 5,181,921, Cl. 606-195.000.

Makitalo, Valto J.: *See*—
Lilja, Launo L.; Makitalo, Valto J.; Hultholm, Stig-Erik; and Nyman, Bror G., 5,182,087, Cl. 422-228.000.

Makus, Peter M., to Wang Laboratories, Inc. System for parsing multidimensional and multidirectional text into encoded units and storing each encoded unit as a separate data structure. 5,182,709, Cl. 364-419.000.

Malhi, Satwinder; and Efland, Taylor R., to Texas Instruments Incorporated. Process for manufacturing a DMOS transistor. 5,182,222, Cl. 437-41.000.

Manchand, Percy S.: *See*—
Yiannikouros, George P.; and Manchand, Percy S., 5,182,393, Cl. 549-4.000.

Manganaro, Paul R. Multiple stream fluid mixing and dispensing apparatus. 5,181,538, Cl. 137-607.000.

Manheimer, Wallace M.; Robson, Anthony E.; and Meger, Robert A., to United States of America, Navy. Method and apparatus for forming an agile plasma mirror effective as a microwave reflector. 5,182,496, Cl. 315-111.410.

Mannella, Lawrence F.: *See*—
Grosswiller, Leo J.; Theriault, F. Michael; Mannella, Lawrence F.; and Anders, Walter G., 5,181,805, Cl. 406-189.000.
Grosswiller, Leo J.; Theriault, F. Michael; Mannella, Lawrence F.; and Anders, Walter G., 5,181,806, Cl. 406-189.000.

Mannesmann AG: *See*—
Goepel, Ernst; and Schierjott, Rudolf, 5,182,578, Cl. 346-140.00R.

Mannesmann Aktiengesellschaft: *See*—
Brausfeld, Walter, 5,181,692, Cl. 251-367.000.

Mannesmann Aktiengesellschaft: *See*—
Bernauer, Otto, 5,182,089, Cl. 423-219.000.
Durler, Egon, 5,181,801, Cl. 400-708.000.

Manos, M. Michele; Wright, Deann K.; and Ting, Yi, to Hoffmann-La Roche Inc. Probes for detection of human papillomavirus. 5,182,377, Cl. 536-24.320.

Mansour, Omar M.: *See*—
Askew, James D.; Chao, Chin-Wang; Cochran, David R.; Dollard, Peter M.; Eslambolchi, Hossein; Goodson, William E.; Guenther, Robert P.; Mansour, Omar M.; Nguyen, Liem T.; and Tanuku, Sarma S., 5,182,744, Cl. 370-16.000.

Manz, Kenneth W., to SPX Corporation. Refrigerant handling system with air purge and multiple refrigerant capabilities. 5,181,391, Cl. 62-129.000.

Maraganore, John M.; and Jakubowski, Joseph A., to Biogen, Inc.; and Boston University, Trustees of. DNA sequences encoding snake venom inhibitors of platelet activation processes for producing those inhibitors and compositions using them. 5,182,260, Cl. 514-12.000.

Marande, Bruno: *See*—
Joncour, Christian; Chansavoir, Alain; and Marande, Bruno, 5,181,344, Cl. 51-165.750.

Marcon Electronics Co., Ltde.: *See*—
Handa, Kiyoji; Mukaeda, Satoshi; Kanai, Hideyuki; Yamashita, Yohachi; Furukawa, Osamu; and Harata, Mitsuo, 5,182,695, Cl. 361-321.000.

Marcus, Harris L.; Lakshminarayan, Udaykumar; and Bourell, David L., to Board of Regents, The University of Texas System. Method of producing parts by selective beam interaction of powder with gas phase reactant. 5,182,170, Cl. 428-551.000.

Marcus, Stanley; and Kim, Wendy Y. Topical virucidal composition for treatment of mucocutaneous tissue. 5,182,104, Cl. 424-78.070.

Maria van Hout, Hendricus H.; Oyevaar, Martin H.; and Held, Bert J., to General Electric Company. Method for the continuous preparation of aromatic polycarbonate having a high molecular weight with static mixer and plug flow. 5,182,361, Cl. 528-371.000.

Marin, Carlo, to Pirelli Cable Corporation. Extrusion process and apparatus for low contaminant cable insulation. 5,182,066, Cl. 264-169.000.

Marion Merrell Dow, Inc.: *See*—
Ahmed, Nahed K., 5,182,268, Cl. 514-39.000.

Marler, David O., to Mobil Oil Corp. Catalysts bound with low acidity refractory oxide. 5,182,242, Cl. 502-66.000.

Marlin, Bradford S.: *See*—
Daub, John P.; Lahm, George P.; and Marlin, Bradford S., 5,182,303, Cl. 514-583.000.

Marshall, Mark G.: *See*—
Erdelyi, Charles K.; Marshall, Mark G.; Mathews, John W.; and Perry, Patrick E., 5,182,468, Cl. 307-296.100.

Martell, Steve. Soap dish. 5,181,606, Cl. 206-77.100.

Martin, Annette: *See*—
Girard, Marc; Wychowski, Czeslaw; and Martin, Annette, 5,182,211, Cl. 435-320.100.

Martin, David M.: *See*—
Buckshaw, Thomas M.; Erdelsky, Joseph J.; and Martin, David M., 5,182,539, Cl. 337-310.000.

Martin, Guy E., to Aerospatiale Societe Nationale Industrielle. Benchmark device for a plane face, and a machining system implementing it. 5,181,809, Cl. 408-3.000.

Martin, James E.; and Robison, Richard G., to International Paper Company. Tear-strip testing apparatus. 5,181,424, Cl. 73-835.000.

Martin, Kevin J.: *See*—
Kuhlmann, Erven J.; Pascoe, James R.; Browne, James E.; and Martin, Kevin J., 5,182,247, Cl. 502-217.000.

Martin, Vaughn H.: *See*—
Gentile, Joseph P.; and Martin, Vaughn H., 5,181,642, Cl. 226-137.000.

Martinez, John E.: *See*—
Savegh, Emile G.; Martinez, John E.; and Cedrone, Alfredo, 5,182,785, Cl. 385-128.000.

Martinovich, Krsman: *See*—
Beyer, Donald R.; Miller, Matthew R.; and Martinovich, Krsman, 5,182,761, Cl. 375-119.000.

Marton, John P.: *See*—
Plant, Rex B.; and Marton, John P., 5,181,458, Cl. 99-538.000.

Martz, Jonathan T.; Schimmel, Karl F.; Sundararaman, Padmanabhan; and Walters, David N., to PPG Industries, Inc. Polyurethane polyanhydride oligomers and method of preparation. 5,182,355, Cl. 528-75.000.

Maruta, Hidekazu: *See*—
Yamamoto, Akira; Kimura, Shigeo; Kusaka, Kensaku; Maruta, Hidekazu; and Adachi, Hiroyuki, 5,182,606, Cl. 355-289.000.

Maruyama, Junichi; Fukumura, Teruo; and Kawaguchi, Sadatsugu, to Nissan Morot Co., Ltd.; and Uryu Siesaku, Ltd. Impact wrench having torque controlling faculty. 5,181,575, Cl. 173-180.000.

Maruyama, Masao; Kozakura, Nobuto; and Nakakubo, Katsuya, to Tsubakimoto Chain Co. Tensioner for a toothed belt. 5,181,889, Cl. 474-110.000.

Maruzen Petrochemical Co., Ltd.: *See*—
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Shuji; Nakajima, Ryoichi; and Naito, Sakae, 5,182,011, Cl. 208-39.000.

Marygold, Paul H.: *See*—
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.

Masamizu, Koji: *See*—
Yanaba, Shigeru; Shiobara, Masataka; Masamizu, Koji; Morohara, Kiyoshi; and Abe, Seiji, 5,182,044, Cl. 252-174.240.

Masarati, Enrico: *See*—
Cipolli, Roberto; Oriani, Roberto; Nucida, Gilberto; and Masarati, Enrico, 5,182,388, Cl. 544-195.000.

Masatoshi, Kawanabe, to Sugatsune Industrial Co., Ltd. Lock indicator for caster. 5,181,587, Cl. 188-1.120.

Maschinenfabrik Rau GmbH, Firma: *See*—
Rau, Willy; Rau, Wolfgang; and Taus, Christian, 5,181,476, Cl. 111-60.000.

Maschinenfabrik Rieter AG: *See*—
Demuth, Robert; and Faas, Jurg, 5,181,295, Cl. 19-65.00A.

Masel, Ruben; and Valdshtein, George, to Talbert Ltd. Electric grilling appliance. 5,181,455, Cl. 99-391.000.

Masino, Albert P. Olefin polymerization method. 5,182,341, Cl. 526-125.000.

Mason, Martin K.: *See*—
Solomon, Rodney J.; Mason, Martin K.; Gruner, George; and Fearnside, James T., 5,181,514, Cl. 128-660.090.

Masuda, Katsuyoshi, to Molex Incorporated. Press-contact type electric connector for a flat, flexible cable. 5,181,854, Cl. 439-67.000.

Masuda, Shunichi; Shimizu, Katsuichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Image forming device. 5,182,597, Cl. 355-205.000.

Masuda, Toru; and Kamijo, Akinori, to Fujitsu Limited. Inter-network connection system. 5,182,550, Cl. 340-825.050.

Masuda, Tsutomu: *See*—
Kajiyama, Naoki; Masuda, Tsutomu; Tatsumi, Hiroki; and Nakano, Eiichi, 5,182,202, Cl. 435-189.000.

Masuda, Yoshifumi: *See*—
Ohtsuka, Yoshihiro; and Masuda, Yoshifumi, 5,182,448, Cl. 250-214.00B.

Mathauer, Klemens: *See*—
Schwiegk, Stefan; Mathauer, Klemens; Wegner, Gerhard; Hoffmann, Bernd F. W.; and Vogel, Albrecht, 5,182,005, Cl. 204-435.000.

Mathews, John W.: *See*—
Erdelyi, Charles K.; Marshall, Mark G.; Mathews, John W.; and Perry, Patrick E., 5,182,468, Cl. 307-296.100.

Matsubara, Isamu: *See*—
Sugitani, Yoshihisa; and Matsubara, Isamu, 5,181,825, Cl. 414-786.000.

Matsubara, Koshi: *See*—
Okada, Tadao; Ikeno, Hajime; Ozeki, Yuji; Higaki, Yoshikazu; Matsubara, Koshi; and Nakamura, Kenichi, 5,182,349, Cl. 526-265.000.

Matsuda, Hiroshi; and Suzuki, Michitaka, to JEOL Ltd.; and JEOL Technics Co. Ltd. Scanning electron microscope. 5,182,454, Cl. 250-310.000.

Matsuda, Hiroshi: *See*—
Noda, Touru; Tsubaki, Masayuki; Sakai, Yasunosuke; Ashida, Tetsuya; and Matsuda, Hiroshi, 5,182,161, Cl. 428-195.000.
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Takei, Hajime; Yamakoshi, Yukiyoshi; Matsuda, Naoyuki; Moro, Fuminori; Tomita, Hiroshi; and Sano, Homare, 5,181,707, Cl. 271-20.000.

Matsugu, Hidetomo: *See*—
Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, 5,182,140, Cl. 427-230.000.

Matsuhiro, Keiji: *See*—
Kawasaki, Shinji; Kajita, Masaharu; and Matsuhiro, Keiji, 5,182,059, Cl. 264-65.000.

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Ieki, Atsushi; Hayashi, Yasukazu; and Matsui, Keiji, 5,182,613, Cl. 356-374.000.

Matsui, Naoki: *See*—
Yoshioka, Osami; Matsui, Naoki; Sato, Hiroaki; Omori, Kouji; Yamazaki, Masayuki; Suzuki, Masafumi; Oishi, Hitoshi; Kitagawa, Naoto; Seike, Takaya; and Araki, Yasuhiro, 5,182,074, Cl. 266-87.000.

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Nakai, Hideo; Yamada, Koichiro; Nomura, Shumihiro; Matsumoto, Mamoru; and Iwata, Hiroshi, 5,182,296, Cl. 514-376.000.

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Nagasawa, Tsugio; Shuto, Tadashi; Matsumoto, Toshiaki; Sakuraya, Hideo; and Nishimoto, Shoji, 5,182,252, Cl. 503-227.000.

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Kuroda, Kenichi; and Matsuo, Akinori, 5,182,719, Cl. 364-490.000.

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Komatsubara, Toshio; Tagata, Tsutomu; and Matsuo, Mamoru, 5,181,969, Cl. 148-552.000.

Matsuoka, Yuzo: *See*—
Iwasaki, Tameo; Kondo, Kazuhiko; Matsuoka, Yuzo; Matsumoto, Mamoru; and Sugiura, Masaki, 5,182,404, Cl. 548-237.000.

Matsushima, Hiroaki: *See*—
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Matsushima, Yasuhiro: *See*—
Shimada, Takayuki; Matsushima, Yasuhiro; and Takafuji, Yutaka, 5,182,620, Cl. 257-72.000.

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Goto, Takeshi, 5,182,551, Cl. 340-825.240.
Harafuji, Kenji; Misaka, Akio; Hamaguchi, Hiromitsu; and Kawakita, Kenji, 5,182,718, Cl. 364-490.000.
Inaji, Toshio; and Gotou, Makoto, 5,182,499, Cl. 318-254.000.
Kayashima, Kazuhiro; Tateishi, Fumikazu; and Ohshima, Kiyoko, 5,182,790, Cl. 385-141.000.
Mizuno, Yasuo; Ikeda, Masaki; and Yoshida, Akihiko, 5,181,947, Cl. 65-2.000.
Murai, Mikio; Takahashi, Kiyoshi; Odagiri, Masaru; Kai, Yoshiaki; Suzuki, Takashi; and Kunieda, Toshiaki, 5,182,132, Cl. 427-577.000.
Niwa, Masaaki; and Okada, Shozo, 5,182,452, Cl. 250-307.000.
Yamate, Kazunori; Kinoshita, Hideo; Uenishi, Chikara; Ugajin, Masafumi; Kidokoro, Shinichi; and Yamagiwa, Hiroshi, 5,182,497, Cl. 315-383.000.

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Hiramatsu, Akinori; Okamoto, Futoshi; Kido, Hiroshi; Sako, Hiroyuki; Yamanaka, Yukio; and Yamada, Koji, 5,182,702, Cl. 363-132.000.
Mori, Hidetaka; Takedomi, Yasunari; and Morimoto, Takao, 5,181,603, Cl. 200-302.100.

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Tsuda, Yoshiyuki; and Iwamoto, Akiko, 5,181,558, Cl. 165-133.000.

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Matthews, Arthur J. Emergency exit security window blinds. 5,181,548, Cl. 160-172.000.

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Chappell, Ian C.; Matusch, Peter W. G.; and Matusch, Dagobert R., 5,181,600, Cl. 198-812.000.

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Nakashima, Hisaharu; Hayasaki, Hiroyuki; Suzuki, Masami; Saito, Yoshinori; and Matuyama, Hisasi, 5,182,635, Cl. 358-12.000.

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Cote, Pierre L.; Maurion, Roger P.; Lipski, Christopher J.; and Pedersen, Steven K., 5,182,019, Cl. 210-321.800.

Maxpat Trading & Marketing (Far West) Limited: *See*—
Koo, Vincent H., 5,181,322, Cl. 30-416.000.

May, Karl-Heinz: *See*—
Rodi, Anton; Hauck, Dieter; May, Karl-Heinz; and Muller, Hans, 5,182,803, Cl. 395-575.000.

Mayerbock, Wilhelm: *See*—
Fiene, Rudiger; and Mayerbock, Wilhelm, 5,181,698, Cl. 267-140.120.

Mayo, Frank, to Halliburton Geophysical Services, Inc. System for generating correction signals for use in forming low distortion analog signals. 5,182,558, Cl. 341-118.000.

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Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Mazda Motor Corporation: *See*—
Hirose, Ichiro; Handa, Tomohisa; Iwata, Noriyuki; and Choshi, Masahiro, 5,181,485, Cl. 123-90.170.
Kan, Toshiya; and Sakamoto, Katsuhiko, 5,181,484, Cl. 123-90.170.

Mazoki, Gary: *See*—
Aquilera, Luis; Appalucci, Lawrence C.; and Mazoki, Gary, 5,182,544, Cl. 340-572.000.

Mazza, Dominick J. Speed loader for muzzle-loading firearms. 5,182,412, Cl. 42-90.000.

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Taylor, Stewart S.; McCormack, Gary D.; Davenport, William H.; and Hamilton, Patrick J., 5,182,467, Cl. 307-243.000.

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McCracken, Robert E., to Ryobi Motor Products Corp. Split ring lever clamping arrangement. 5,181,813, Cl. 409-182.000.

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Nickolls, Peter; Lu, Richard M. T.; Collins, Kenneth A.; McCulloch, Roy M.; Cheatle, Lucy M.; and Cleland, Brian, 5,181,511, Cl. 128-419.0PG.

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Creasman, Edwin A.; Paul, Thomas R.; Weber, Kenneth E.; Navarrete, David R.; McCullough, Jimmy D.; and Soodjinda, Churchai T., 5,182,053, Cl. 264-1.400.

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McDonagh, Paul F. Method of evaluating cardioprotective agents. 5,181,518, Cl. 128-696.000.

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Palfreyman, Michael G.; Bey, Philippe; and McDonald, Ian A., 5,182,297, Cl. 514-438.000.

McDonnell Douglas Corporation: *See*—
Runyan, Max R., 5,181,647, Cl. 228-44.300.

McEwen, James A., to Abatis Medical Technologies Limited. Tourniquet for sensing and regulation of applied pressure. 5,181,522, Cl. 128-748.000.

McFalls, Charles S., Jr.; Sproule, Patrick A.; and Mullins, Michael A., to Mitsubishi Semiconductor America, Inc. Array layout structure for implementing large high-density address decoders for gate array memories. 5,182,727, Cl. 365-230.060.

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McGrath, Michael F.: *See*—
Collier, Robert J.; and McGrath, Michael F., 5,182,302, Cl. 514-573.000.

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Lew, Chel W.; Aufdemorte, Thomas B.; McGuff, Howard S.; and Alderson, Gerald L., 5,181,505, Cl. 128-200.260.
McHale, Daniel M. Backpack with independently adjustable stabilizing straps and shoulder pads. 5,181,638, Cl. 224-215.000.
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Kapp, David C.; Boston, Russell E.; Carlblom, Leland H.; McKinley, Mildred L.; and Kozma, Jess A., 5,182,148, Cl. 428-34.600.
McKown, Kenneth W.; and Rothenberger, Danny, to Halliburton Company. Methods of selectively reducing the water permeabilities of subterranean formations. 5,181,568, Cl. 166-293.000.
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Maurer, Robert D.; and McLaughlin, Timothy B., 5,182,588, Cl. 351-165.000.
McNally, Mark P., to Procter & Gamble Company, The. Vessel having dual function pouring spout for spot treating or rapid transfer of viscous liquids. 5,181,630, Cl. 222-109.000.
McNeil (Ohio) Corporation: *See*—
Beck, David C.; and Gundlach, Philip M., Jr., 5,182,720, Cl. 364-509.000.
McNeil-PPC, Inc.: *See*—
Amaral, Everson, 5,181,563, Cl. 604-385.200.
McNeill, Ray O.: *See*—
Johnson, Drey; Gaude, Robert; Farrow, Robert I.; DeMint, Paul; and McNeill, Ray O., 5,181,669, Cl. 242-56.00R.
McNulty, John F. Optional bed arrangement for ship stateroom use. 5,181,286, Cl. 5-8.000.
Mead, Gerald R. Simulation log siding apparatus. 5,181,358, Cl. 52-233.000.
Meadows, Clarence A., to General Motors Corporation. Process for heat sealing a cover to a container. 5,181,936, Cl. 29-623.200.
Meadows, Merman R. Scaffold for an a-frame ladder. 5,181,582, Cl. 182-121.000.
Meckler, Gershon. Air conditioning apparatus. 5,181,387, Cl. 62-59.000.
Meckstroth, Alan F. Leaf deflecting cover device for a rain gutter. 5,181,350, Cl. 52-12.000.
Medical Safety Products, Inc.: *See*—
Wanderer, Alan A.; and Sagstetter, William E., 5,181,524, Cl. 128-764.000.
Mediscus Group Inc., The: *See*—
Heaton, Keith P.; Hunt, Kenneth W.; and Boughton, Rutland S., 5,181,288, Cl. 5-607.000.
Medveczky, Geza; and Lunsford, Kelvin. System and apparatus for protecting computer software. 5,182,770, Cl. 380-4.000.
Meeker, Paul K., to Lisco, Inc. Child restraint system. 5,181,761, Cl. 297-250.000.
Meeks, William R.: *See*—
Hill, Alan M.; and Meeks, William R., 5,181,899, Cl. 493-34.000.
Meger, Robert A.: *See*—
Manheimer, Wallace M.; Robson, Anthony E.; and Meger, Robert A., 5,182,496, Cl. 315-111.410.
Mehrer, George W.: *See*—
Hannah, Marcia G.; Mehrer, George W.; Noone, Michael J.; Stahl, Kermit E.; and Quaranta, Joseph, 5,181,361, Cl. 52-535.000.
Meister, Donald F.: *See*—
Roemmele, Carl F.; and Meister, Donald F., 5,181,348, Cl. 51-410.000.
Melchers, Georg F.: *See*—
Bauer, Steven R.; Kudo, Akira; Melchers, Georg F.; and Sakaguchi, Nobuo, 5,182,205, Cl. 435-240.200.
Melega, Robert G.: *See*—
Gambogi, William J., Jr.; and Melega, Robert G., 5,182,180, Cl. 430-1.000.
Memminger-Iro GmbH: *See*—
Braun, Dieter; Huss, Rolf; and Lampprecht, Alfred, 5,181,585, Cl. 184-7.400.
Mendori, Hiroaki: *See*—
Igarashi, Toshio; Shinohara, Sueharu; Tatsumi, Masayuki; Hikasa, Tadashi; and Mendori, Hiroaki, 5,182,167, Cl. 428-318.600.
Menkin, Paul: *See*—
Brock, Andrew J.; Lin, Lifun; Menkin, Paul; and Polan, Ned W., 5,181,770, Cl. 205-77.000.
Mercedes-Benz AG: *See*—
Feichtiger, Dieter; and Eichberger, Bernd, 5,181,749, Cl. 285-26.000.
Schmid, Friedrich; Joppig, Peter; and Klak, Roland, 5,182,437, Cl. 219-270.000.
Zaiser, Wolfgang; Merkle, Hans; Wagner, Gerhard; and Spengler, Gerhard, 5,181,431, Cl. 74-333.000.
Mercer, Gary L.: *See*—
Burkett, Doug; and Mercer, Gary L., 5,182,439, Cl. 219-412.000.
Merck & Co., Inc.: *See*—
DiNinno, Frank; Rano, Thomas A.; and Greenlee, Mark L., 5,182,384, Cl. 540-302.000.
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Gibilisco, Kenneth J., 5,181,634, Cl. 222-212.000.
Gillard, John W.; Gauthier, Jacques-Yves; Evans, Jillian F.; Fortin, Rejean; Guinon, Yvan; Dixon, Richard A. F.; and Miller, Douglas K., 5,182,367, Cl. 530-350.000.
Helms, Gregory L.; Horn, Wendy S.; Jones, E. Tracy T.; and Linemeyer, David L., 5,182,298, Cl. 514-455.000.
Merck Frosst Canada, Inc.: *See*—
Gillard, John W.; Gauthier, Jacques-Yves; Evans, Jillian F.; Fortin, Rejean; Guinon, Yvan; Dixon, Richard A. F.; and Miller, Douglas K., 5,182,367, Cl. 530-350.000.
Merck Patent Gesellschaft mit beschraenkter Haftung: *See*—
Coates, David; Sage, Ian C.; and Greenfield, Simon, 5,182,047, Cl. 252-299.660.
Merkel, Gerd; Vogt, Wilfried; Glaunsinger, Georg; Stadler, Peter; Zander, Claus-Peter; Maass, Jurgen; Schmitt, Gernot; Necker, Thomas; and Becker, Willi, to Heidelberger Druckmaschinen AG. Clamping and tensioning device. 5,181,469, Cl. 101-415.100.
Merkle, Hans: *See*—
Zaiser, Wolfgang; Merkle, Hans; Wagner, Gerhard; and Spengler, Gerhard, 5,181,431, Cl. 74-333.000.
Merrell Dow Pharmaceuticals Inc.: *See*—
Freedman, Jules; and Bitonti, Alan J., 5,182,387, Cl. 540-590.000.
Kane, John M., 5,182,399, Cl. 546-199.000.
Palfreyman, Michael G.; Bey, Philippe; and McDonald, Ian A., 5,182,297, Cl. 514-438.000.
Sunkara, Sai P.; and Jones, Winton D., 5,182,293, Cl. 514-340.000.
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Metal Leve S.A. Industria E Comercio: *See*—
Bencini, Durval; and Da Silva Praca, Mario S., 5,181,785, Cl. 384-288.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Weber, Ekkehard, 5,181,943, Cl. 55-98.000.
Metcal, Inc.: *See*—
McGaffigan, Thomas H., 5,182,427, Cl. 219-10.750.
Meurer Nonfood Product GmbH: *See*—
Vossen, Franz; and Stoppel, Karl-Anton, 5,181,640, Cl. 225-93.000.
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Meyer, Theodore O., to Advanced Power Technology, Inc. Profile tailored trench etch using a SF_6-O_2 etching composition wherein both isotropic and anisotropic etching is achieved by varying the amount of oxygen. 5,182,234, Cl. 437-233.000.
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Miceli, Joseph J., Jr.: *See*—
Kurtz, Clark N.; and Miceli, Joseph J., Jr., 5,182,735, Cl. 369-13.000.
Michaels, Paul A.: *See*—
Slotkowski, Kenneth G.; Michaels, Paul A.; Macks, Harold R.; and Ewald, Henry J., 5,182,502, Cl. 315-159.000.
Michel, Didier: *See*—
Pierret, Jean-Marie; and Michel, Didier, 5,182,511, Cl. 324-158.0MG.
Michel, M. John; Snyder, Frederick D.; and Emany, Venkateswara R., to WGM Safety Corp. Air purifying respirator suspension. 5,181,507, Cl. 128-201.250.
Michiba, Kouji: *See*—
Matsui, Shigetomo; Uenishi, Masahiro; Iuchi, Sadao; Sugimoto, Kouji; Itoga, Kouyu; Harada, Tetsuzo; Michiba, Kouji; Onda, Katsuhiro; and Okumura, Takaaki, 5,182,775, Cl. 382-8.000.
Michigan Technological University, Board of Control of: *See*—
Crittenden, John C.; Notthakun, Sawang; Hand, David W.; and Perram, David L., 5,182,030, Cl. 210-748.000.
Micol, John S.: *See*—
Gray, Lewis; Garbarino, Joseph L.; Micol, John S.; Crenshaw, Johnny W.; Iacono, Vincent M.; Barley, James C.; Hollen, Richard L.; and Graziani, Terry M., 5,181,308, Cl. 29-436.000.
Micron Technology, Inc.: *See*—
Chern, Wen-Foo, 5,182,529, Cl. 331-57.000.
Chhabra, Navjot; and Sandhu, Gurtej S., 5,182,232, Cl. 437-200.000.
MicroUnity Systems Engineering, Inc.: *See*—
Matthews, James A., 5,182,225, Cl. 437-58.000.
Middlebrook, Thomas F. Heating/cooling or warming stage assembly with coverslip chamber assembly and perfusion fluid preheater/-cooler assembly. 5,181,382, Cl. 62-3.200.
Midgley, Ronald A.: *See*—
Pellow, Terence R.; and Midgley, Ronald A., 5,181,827, Cl. 415-173.300.
Midland Enterprises Inc.: *See*—
Johnson, Fontain M., 5,181,547, Cl. 141-46.000.
Mihara, Tadashi, to Canon Kabushiki Kaisha. Liquid crystal device. 5,182,662, Cl. 359-63.000.
Mihara, Tadashi: *See*—
Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, 5,182,549, Cl. 340-784.000.
Mikoda, Tamio: *See*—
Takuma, Keisuke; Ohyama, Tsukasa; Igata, Akitoshi; Mikoda, Tamio; Ghoda, Isamu; and Koshida, Hitoshi, 5,182,395, Cl. 552-251.000.
Milbar Corporation: *See*—
Anderson, J. Edward C.; and Jeromson, James R., Jr., 5,181,636, Cl. 222-389.000.

Miles Inc.: *See*—
Genshaw, Marvin A.; and Pugia, Michael J., 5,182,213, Cl. 436-66.000.

Miller, Douglas K.: *See*—
Gillard, John W.; Gauthier, Jacques-Yves; Evans, Jillian F.; Fortin, Rejean; Guinon, Yvan; Dixon, Richard A. F.; and Miller, Douglas K., 5,182,367, Cl. 530-350.000.

Miller, George G.: *See*—
Campbell, Richard J.; Miller, George G.; and Venia, Steven P., 5,181,294, Cl. 15-315.000.

Miller, Harry, to Honeywell Inc. Aircraft control surface position transducer. 5,182,505, Cl. 318-565.000.

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Miller, Matthew R.: *See*—
Beyer, Donald R.; Miller, Matthew R.; and Martinovich, Krsman, 5,182,761, Cl. 375-119.000.

Miller, Paul J.: *See*—
Foreman, Kevin G.; and Miller, Paul J., 5,181,859, Cl. 439-225.000.

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Chen, Fusen E.; Dixit, Girish A.; and Miller, Robert O., 5,182,627, Cl. 257-49.000.

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Milling, Philip E.: *See*—
Begun, Ralph M.; Bland, Patrick M.; and Milling, Philip E., 5,182,809, Cl. 395-725.000.

Milner, Michael W.: *See*—
Fan, Eugene; Chen, Fon-Chiu M.; Milner, Michael W.; and Rehg, Leslie J., 5,182,191, Cl. 435-7.900.

Milstein, Yuri: *See*—
Bosses, Mark D.; and Milstein, Yuri, 5,181,946, Cl. 55-381.000.

Mima, Yoshinobu, to Japan Tobacco Inc. Display apparatus. 5,181,334, Cl. 40-524.000.

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Mims, Michael G.: *See*—
Mueller, Mark D.; Jones, Frank L.; Quintana, Julio M.; Ruddy, Kenneth E.; and Mims, Michael G., 5,181,571, Cl. 166-381.000.

Mimura, Akio: *See*—
Mishima, Ken; Mimura, Akio; Takahara, Yoshimasa; Asami, Kouji; and Hanai, Tetsuya, 5,182,193, Cl. 435-29.000.

Minami, Yoshihito: *See*—
Tsukamoto, Toshio; and Minami, Yoshihito, 5,181,577, Cl. 175-261.000.

Mininni, Robert M.: *See*—
Caldwell, J. Brian; Banash, Mark A.; Che, Tessie M.; Mininni, Robert M.; and Warden, Victor N., 5,182,236, Cl. 521-12.000.

Minion, Aaron A.: *See*—
Garvey, Joseph F.; Minion, Aaron A.; and Smith, Warren T., 5,181,365, Cl. 53-455.000.

Minister of National Defence of Her Majesty's Canadian Government: *See*—
Wheat, James A.; Fuoco, Rolland P.; and Dix, J. Kimberley, 5,182,163, Cl. 428-224.000.

Ministero Dell' Universita' E Della Ricerca Scientifica E Tecnologica: *See*—
Cipolli, Roberto; Oriani, Roberto; Nucida, Gilberto; and Masarati, Enrico, 5,182,388, Cl. 544-195.000.

Minnesota Mining and Manufacturing Co.: *See*—
Budd, Kenton D., 5,182,255, Cl. 505-1.000.
DeVoe, Robert J.; Brown-Wensley, Katherine A.; and Tiers, George V. D., 5,182,316, Cl. 522-99.000.
Garvey, Joseph F.; Minion, Aaron A.; and Smith, Warren T., 5,181,365, Cl. 53-455.000.
Pape, Peter H. K.; and Tuschy, Jorg O. P., 5,182,156, Cl. 428-130.000.
Tran, Nang T.; Loeding, Neil W.; and Nins, David V., 5,182,624, Cl. 257-40.000.

Minolta Camera Co., Ltd.: *See*—
Miwa, Katsumi, 5,182,576, Cl. 346-108.000.
Mukai, Hiromu; and Sugihara, Yasumasa, 5,182,672, Cl. 359-652.000.

Minolta Camera Kabushiki Kaisha: *See*—
Hara, Yoshinobu, 5,182,534, Cl. 355-316.000.
Hara, Yoshinobu; Yuge, Shizuo; and Hara, Kazuyoshi, 5,182,598, Cl. 355-208.000.
Kinoshita, Naoyoshi, 5,182,599, Cl. 355-208.000.
Takei, Hajime; Yamakoshi, Yukiyoshi; Matsuda, Naoyuki; Moro, Fuminori; Tomita, Hiroshi; and Sano, Homare, 5,181,707, Cl. 271-20.000.
Tsuboi, Toshio; Moriya, Shigeru; and Nakatani, Keiji, 5,182,638, Cl. 358-80.000.
Yamada, Takanobu, 5,182,603, Cl. 355-273.000.

Misaka, Akio: *See*—
Harafuji, Kenji; Misaka, Akio; Hamaguchi, Hiromitsu; and Kawakita, Kenji, 5,182,718, Cl. 364-490.000.

Mishima, Ken; Mimura, Akio; Takahara, Yoshimasa; Asami, Kouji; and Hanai, Tetsuya, to Kabushiki Kaisha Kobe Seiko Sho. Method for measuring biomass. 5,182,193, Cl. 435-29.000.

Miskin, Michael J.: *See*—
Janota, Kenneth F.; and Miskin, Michael J., 5,181,318, Cl. 29-882.000.

Misra, Chanakya, to Aluminum Company of America. Organoaluminum hydroxide compounds. 5,182,410, Cl. 556-187.000.

Mita Industrial Co., Ltd.: *See*—
Fukunaga, Yasuyuki; Kita, Hideki; Nakakuma, Akira; Taniguchi, Toru; Fukui, Hidehiro; and Takemura, Yoshinobu, 5,182,584, Cl. 346-157.000.
Takaoka, Kazuhito; Uehara, Masatoshi; and Sano, Yumiko, 5,182,182, Cl. 430-124.000.

Mita Industries Co., Ltd.: *See*—
Kishi, Hiroshi, 5,182,651, Cl. 358-296.000.

Mita, Yoshiyuki, to Usui Kokusai Sangyo Kaisha Ltd. Radiator cooling apparatus for an automobile engine. 5,181,554, Cl. 165-41.000.

Mitchell, Grant D., to Tamko Asphalt Products, Inc. Pressure sensitive bituminous compositions. 5,182,319, Cl. 524-68.000.

Mitsubishi Denki K.K.: *See*—
Okada, Kiyoshi, 5,181,441, Cl. 82-1.110.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Akiyama, Hajime; and Kondoh, Hisao, 5,182,626, Cl. 257-142.000.
Andoh, Nobuaki; Kohda, Kenji; Toyama, Tsuyoshi; Noguchi, Kenji; and Kobayashi, Shinichi, 5,182,725, Cl. 365-185.000.
Arimoto, Satoshi, 5,182,229, Cl. 437-162.000.
Eguchi, Kouzi, 5,182,235, Cl. 437-238.000.
Kime, Kenjiro; Egusa, Naoyuki; and Nakamura, Keiji, 5,182,739, Cl. 369-44.150.
Koiwa, Mitsuru; and Morita, Shingo, 5,181,498, Cl. 123-633.000.
Kojima, Shinji, 5,181,496, Cl. 123-493.000.
Matsukawa, Takayuki, 5,182,227, Cl. 437-72.000.
Matumoto, Sigeyuki, 5,182,009, Cl. 205-238.000.
Mitsuhashi, Yasuo, 5,182,683, Cl. 360-77.160.
Sakamura, Ken, 5,182,811, Cl. 395-800.000.
Suzuki, Hiroyoshi, 5,182,519, Cl. 324-611.000.
Takahira, Kenichi, 5,182,442, Cl. 235-492.000.
Tamura, Toshiyuki; Fujita, Masaki; Komori, Shinji; Sato, Hisakazu; and Takata, Hidehiro, 5,182,799, Cl. 395-400.000.
Yamamoto, Yuushin; Sashida, Nobuo; Yamasaki, Yuuko; and Kawabata, Takao, 5,182,463, Cl. 307-46.000.
Yamashita, Hiromi, 5,182,445, Cl. 250-208.100.

Mitsubishi Gas Chemical Co., Inc.: *See*—
Asoh, Toshiaki; and Hosomi, Tatsuhide, 5,182,363, Cl. 528-499.000.
Mochida, Isao; Sakai, Yukio; and Ohtsuka, Hiroyuki, 5,182,010, Cl. 208-44.000.
Tanisake, Hiroka; Koyama, Takeshi; and Isozaki, Tsuyoshi, 5,182,392, Cl. 548-520.000.

Mitsubishi Kasei Corporation: *See*—
Tomiyasu, Hiroshi; Kobayashi, Yoshiko; Goto, Kiyoshi; Yamamoto, Takeshi; and Nakai, Hideyuki, 5,182,183, Cl. 430-165.000.

Mitsubishi Kasei Vinyl Company: *See*—
Asahi, Masaki; and Noro, Yukio, 5,182,362, Cl. 528-486.000.

Mitsubishi Paper Mills Limited: *See*—
Noda, Touru; Tsubaki, Masayuki; Sakai, Yasunosuke; Ashida, Tetsuya; and Matsuda, Hiroshi, 5,182,161, Cl. 428-195.000.

Mitsubishi Pencil Kabushiki Kaisha: *See*—
Osada, Takahiro; and Aoki, Yoko, 5,182,324, Cl. 524-379.000.

Mitsubishi Petrochemical Company, Ltd.: *See*—
Okada, Tadao; Ikeno, Hajime; Ozeki, Yuji; Higaki, Yoshikazu; Matsubara, Koshi; and Nakamura, Kenichi, 5,182,349, Cl. 526-265.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Yamamoto, Naoki; Mukai, Nobuhiro; Ige, Hitoshi; and Atarashi, Junko, 5,182,332, Cl. 525-305.000.

Mitsubishi Semiconductor America, Inc.: *See*—
McFalls, Charles S., Jr.; Sproule, Patrick A.; and Mullins, Michael A., 5,182,727, Cl. 365-230.060.

Mitsuhashi, Hiroshi: *See*—
Takahashi, Mitsuhiko; Miyata, Hirofumi; Yuki, Shinya; Nonaka, Keizo; Nakano, Yoshihisa; Mitsuhashi, Hiroshi; Yamaguchi, Katsuya; and Yoshida, Yasuhiko, 5,181,888, Cl. 474-101.000.

Mitsuhashi, Yasuo, to Mitsubishi Denki Kabushiki Kaisha. Position control of a magnetic head in a magnetic recording and reproducing system. 5,182,683, Cl. 360-77.160.

Mitsui Kinzoku Kogyo Kabushiki Kaisha: *See*—
Shibata, Thoru, 5,181,754, Cl. 292-216.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Kise, Shoichi; Hayashida, Mikio; Ori, Aiichiro; Hiratsuka, Junzou; and Yamada, Hideaki, 5,182,198, Cl. 435-126.000.
Ohe, Tatsuta, 5,181,659, Cl. 239-556.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Takuma, Keisuke; Ohyama, Tsukasa; Igata, Akitoshi; Mikoda, Tamio; Ghoda, Isamu; and Koshida, Hitoshi, 5,182,395, Cl. 552-251.000.
Takuma, Keisuke; Irizato, Yoshihiro; and Katho, Kimitoshi, 5,182,409, Cl. 556-146.000.

Miura, Sadayoshi: *See*—
Fukuda, Masayuki; and Miura, Sadayoshi, 5,182,169, Cl. 428-343.000.

Miwa, Katsumi, to Minolta Camera Co., Ltd. Raster scanning apparatus. 5,182,576, Cl. 346-108.000.

Miyake, Akira; and Yamamoto, Yoshinori, to Hitachi Maxell, Ltd. Flexible magnetic disc. 5,182,153, Cl. 428-64.000.

Miyake, Hiroyuki; Abe, Tsutomu; Ito, Hisao; Hotta, Hiroyuki; Shimizu, Yasumoto; and Sakai, Yoshihiko, to Fuji Xerox Co., Ltd. Image sensor and method of manufacturing the same. 5,182,625, Cl. 257-443.000.

Miyake, Ichiro: *See*—
Hatanaka, Yuuji; Okamoto, Hiroo; Arai, Takao; Wakumura, Shinichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 5,182,678, Cl. 360-32.000.

Miyamoto, Mitsuaki: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.

Miyasaka, Tohru: *See*—
Nakazawa, Takashi; Ohshima, Minoru; Ishikawa, Masami; Ogawa, Tsukasa; Miyasaka, Tohru; and Umeda, Takao, 5,182,596, Cl. 355-203.000.

Miyashita, Akimi; Fujii, Mutsumasa; Kubosawa, Minoru; Torii, Keiichiro; Ooki, Nobuaki; Kogawa, Kiyonori; Kawaguchi, Masami; Murooka, Hideyasu; and Kyooi, Masayuki, to Hitachi, Ltd.; and Hitachi Techno Engineering Co., Ltd. Hot press. 5,182,121, Cl. 425-338.000.

Miyata, Hirofumi: *See*—
Takahashi, Mitsuhiko; Miyata, Hirofumi; Yuki, Shinya; Nonaka, Keizo; Nakano, Yoshihisa; Mitsuhashi, Hiroshi; Yamaguchi, Katsuya; and Yoshida, Yasuhiko, 5,181,888, Cl. 474-101.000.

Miyazaki, Akihiko, to U.S. Philips Corporation. Automatic focus control device. 5,182,649, Cl. 358-227.000.

Miyazaki, Akira: *See*—
Kitahama, Michihiro; and Miyazaki, Akira, 5,181,307, Cl. 29-434.000.

Miyazawa, Tadashi, to Sanden Corporation. Coin return control system for vending machines. 5,181,882, Cl. 453-63.000.

Miyoshi, Tadahiko: *See*—
Gotoh, Yoshitaka; Kikuchi, Shigeru; Nakazawa, Tetsuo; Miyoshi, Tadahiko; Oyama, Tetsuo; Ozawa, Yoshihiro; and Itoh, Shinichi, 5,182,075, Cl. 376-150.000.

Mizokami, Takuya; and Arai, Shinichi, to Hitachi, Ltd. Method and apparatus for correctly storing data recorded on a rotational disc-shaped recording medium despite occurrence of clock synchronization disorder. 5,182,740, Cl. 369-47.000.

Mizukoshi, Katsuro: *See*—
Hongo, Mikio; Mizukoshi, Katsuro; Sano, Shyuzo; Kamimura, Takashi; and Takahashi, Takahiko, 5,182,231, Cl. 437-173.000.

Mizuno, Hireyuki: *See*—
Kurazumi, Toshiaki; Mizuno, Hireyuki; Imamori, Katsumi; and Iwasa, Akira, 5,182,112, Cl. 424-439.000.

Mizuno, Kazunori, to Fuji Photo Film Co., Ltd. Photographic film cassette. 5,181,671, Cl. 242-71.100.

Mizuno, Naohito: *See*—
Nishida, Minoru; Mizuno, Naohito; Ohtsuka, Yoshinori; Ozaki, Tadashi; and Uesugi, Hiroshi, 5,181,417, Cl. 73-115.000.

Mizuno, Yasuo; Ikeda, Masaki; and Yoshida, Akihiko, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing a glass fiber. 5,181,947, Cl. 65-2.000.

Mizusawa, Nobutoshi: *See*—
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Mizusawa, Nobutoshi; Suda, Shigeyuki; Nose, Noriyuki; and Kariya, Takao, 5,182,615, Cl. 356-400.000.

Mizuse, Harumi; and Kawata, Kazuhide, to NEC Corporation. Assembler system for determining when to compile source code modules. 5,182,807, Cl. 395-700.000.

Mizutome, Atsushi: *See*—
Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, 5,182,549, Cl. 340-784.000.

Mobil Oil Corporation: *See*—
Chu, Shaw-Chang; and Kirk, Kevin A., 5,182,168, Cl. 428-330.000.
Dwyer, Francis G.; Chu, Pochen; and Cormier, William E., Jr., 5,182,090, Cl. 423-704.000.
Marler, David O., 5,182,242, Cl. 502-66.000.
Okorodudu, Abraham O. M.; and Cardis, Angeline B., 5,182,036, Cl. 252-47.500.

Mochida, Isao; Sakai, Yukio; and Ohtsuka, Hiroyuki, to Mitsubishi Gas Chemical Company, Inc. Mesophase pitch for use in the making of carbon materials. 5,182,010, Cl. 208-44.000.

Mochikawa, Hiroshi; Hirose, Tatsuya; and Horiguchi, Taki, to Kabushiki Kaisha Toshiba. Three-phase PWM inverter providing an improved output sinusoidal waveform. 5,182,701, Cl. 363-98.000.

Mochizuki, Motoyasu: *See*—
Hibino, Sadayoshi; Sato, Tadayuki; and Mochizuki, Motoyasu, 5,182,483, Cl. 310-211.000.

Moda Solaris S.p.A.: *See*—
Bennato, Antonio, 5,182,586, Cl. 351-47.000.

Modrek, Borzo: *See*—
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.

Molex Incorporated: *See*—
Dambach, Philip J.; Long, Jerry A.; and Sampson, Stephen A., 5,181,852, Cl. 439-52.000.
Janota, Kenneth F.; and Miskin, Michael J., 5,181,318, Cl. 29-882.000.
Masuda, Katsuyoshi, 5,181,854, Cl. 439-67.000.

Moller, Brent: *See*—
Lindgren, Claes; Moller, Brent; Petersen, Flemming O.; and Vigenberg, Stig F., 5,181,340, Cl. 49-371.000.

Moller, Eckhard: *See*—
Breuker, Walter; Wagner, Hans; Moller, Eckhard; and Schleimer, Bernhard, 5,181,987, Cl. 159-4.080.

Monacelli, Umberto. Pneumatic fastener driving apparatus with piston holding detent. 5,181,450, Cl. 91-41.000.

Monsanto Company: *See*—
Blyth, Randolph C.; and Ucci, Pompelio A., 5,182,154, Cl. 428-96.000.
Collier, Robert J.; and McGrath, Michael F., 5,182,302, Cl. 514-573.000.
Storrs, Stephen B.; and Schorey, Jeffrey S., 5,182,369, Cl. 530-647.000.

Montgomery, Melvin G., to Atlantic Richfield Company. Demodulation system for phase shift keyed modulated data transmission. 5,182,760, Cl. 375-52.000.

Monthony, James F.; Livingston, Dwight; Reuben, Jayakumar; and Tite, Robert C., to Becton, Dickinson and Company. Multiple aliquot device for distributing a liquid solution into a well. 5,182,082, Cl. 422-57.000.

Montoya, Arturo T. Plastic bag carrier. 5,181,757, Cl. 294-159.000.

Montresor, Beverly: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Moore, Earl T.: *See*—
Hutchison, Wayne R.; Patterson, Jon M.; Hardesty, Terry D.; Teal, Richard D.; Hayes, Eugene G.; Coffey, Michael J.; and Moore, Earl T., 5,181,688, Cl. 248-680.000.

Moore, Johnnie L.: *See*—
Dorsey, James C.; and Moore, Johnnie L., 5,181,527, Cl. 128-830.000.

Moore, Richard E.: *See*—
Abraham, Robert L.; Moore, Richard E.; Rich, William L.; Shackelford, Floyd W.; Tiller, John R., Jr.; and Briggs, Richard S., Jr., 5,182,804, Cl. 395-600.000.

Moore, Susan: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Mooring, Anne: *See*—
Wu, Chengjiu; Mooring, Anne; and Yardley, James T., 5,182,185, Cl. 430-165.000.

Moran, John R.: *See*—
Ebersole, Richard C.; and Moran, John R., 5,182,203, Cl. 435-196.000.

Mordue, George S.: *See*—
Gilbert, Ronald E.; and Mordue, George S., 5,181,828, Cl. 415-200.000.

Morehouse Foods, Inc.: *See*—
Latter, David L., 5,181,632, Cl. 222-153.000.

Mori, Hideaki: *See*—
Shia, Yoshiaki; Mori, Hideaki; Kida, Otojiro; and Taketsugu, Hiroshi, 5,181,779, Cl. 374-139.000.

Mori, Hidetaka; Takedomi, Yasunari; and Morimoto, Takao, to Matsushita Electric Works, Ltd. Sealed electric switch. 5,181,603, Cl. 200-302.100.

Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, to Seiko Epson Corporation. Surface emission type semiconductor laser. 5,182,757, Cl. 372-45.000.

Mori, Toshihiro: *See*—
Ishinaga, Hiroyuki; Saito, Asao; and Mori, Toshihiro, 5,182,577, Cl. 346-140.00R.

Morimoto, Hisashi: *See*—
Arisaki, Kenji; and Morimoto, Hisashi, 5,181,990, Cl. 196-110.000.

Morimoto, Takao: *See*—
Mori, Hidetaka; Takedomi, Yasunari; and Morimoto, Takao, 5,181,603, Cl. 200-302.100.

Morita, Kunihiko, to Nippon Thompson Co., Ltd. Anti-vibration linear motion guide unit. 5,181,780, Cl. 384-8.000.

Morita, Shingo: *See*—
Koiwa, Mitsuru; and Morita, Shingo, 5,181,498, Cl. 123-633.000.

Morita, Shizuo: *See*—
Fukuchi, Masakazu; Morita, Shizuo; Haneda, Satoshi; Satoh, Hisao; and Ikeda, Tadayoshi, 5,182,595, Cl. 355-200.000.

Morita, Takeshi: *See*—
Honma, Kazuhiro; Watanabe, Kunio; Morita, Takeshi; and Nanao, Shingo, 5,181,860, Cl. 439-321.000.

Moriya, Masao: *See*—
Hasegawa, Shin; Oyama, Hajime; Katoh, Eiichi; and Moriya, Masao, 5,182,600, Cl. 355-246.000.

Moriya, Shigeru: *See*—
Tsuboi, Toshio; Moriya, Shigeru; and Nakatani, Keiji, 5,182,638, Cl. 358-80.000.

Moro, Fuminori: *See*—
Takei, Hajime; Yamakoshi, Yukiyoshi; Matsuda, Naoyuki; Moro, Fuminori; Tomita, Hiroshi; and Sano, Homare, 5,181,707, Cl. 271-20.000.

Moro, Osamu: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Morohara, Kiyoshi: *See*—
Yanaba, Shigeru; Shiobara, Masataka; Masamizu, Koji; Morohara, Kiyoshi; and Abe, Seiji, 5,182,044, Cl. 252-174.240.

Morrall, Stephen W.; Gosselink, Eugene P.; Pan, Robert Y.; and Nayar, Bala C., to Procter & Gamble Company, The. Sulfobenzoyl end-capped ester oligomers useful as soil release agents in granular detergent compositions. 5,182,043, Cl. 252-174.000.

Morris, Stanley V.: *See*—
Duren, Richard E.; and Morris, Stanley V., 5,182,729, Cl. 367-38.000.

Morsdorf, Peter; Engler, Heidrun; Schickaneder, Helmut; and Ahrens, Kurt-Henning, to Heumann Pharma GmbH & Co. Imidazolyl propyl guanidine derivative and a pharmaceutical composition containing this compound. 5,182,294, Cl. 514-341.000.

Mortensen, J. D.: *See*—
Winters, Suzanne; Solen, Kenneth A.; Sanders, Clifton G.; Mortensen, J. D.; and Berry, Gaylord, 5,182,317, Cl. 523-112.000.

Morton International, Inc.: *See*—
Lazarus, Richard M.; Ksutz, Randall; and Dixit, Sunit S., 5,182,184, Cl. 430-165.000.
Patton, Richard A.; and Richardson, Walter A., 5,182,046, Cl. 252-188.260.

Moses, Charlie: *See*—
Foster, Glenn D.; and Moses, Charlie, 5,181,653, Cl. 236-49.300.

Mosquera, Rene A.; and Lin, Michael A., to ITT Corporation. Simplified contact connector system. 5,181,855, Cl. 439-74.000.

Motoi, Taiko: *See*—
Kishi, Fumio; Akaike, Masatake; Yamamoto, Keisuke; Motoi, Taiko; Kaneko, Norio; Iwatate, Fujio; Ohmi, Kazuaki; Kawasaki, Takehiko; and Shinjou, Atsuko, 5,182,253, Cl. 505-1.000.

Motorola, Inc.: *See*—
Beyer, Donald R.; Miller, Matthew R.; and Martinovich, Krsman, 5,182,761, Cl. 375-119.000.
Hanna, John E.; and Abdi, Behrooz, 5,182,476, Cl. 307-491.000.
Kazecki, Henry L.; and Baker, James C., 5,182,749, Cl. 370-100.100.
Knapp, James H.; and Nelson, Keith E., 5,182,071, Cl. 264-272.130.
Kung, Patrick S., 5,182,553, Cl. 340-825.440.
Pfiester, James R., 5,182,619, Cl. 257-382.000.
Stamps, Douglass K., Jr.; Ponce de Leon, Lorenzo A.; and King, Jeffrey S., 5,182,568, Cl. 343-702.000.

Motoyama, Yu; and Katoh, Ryusuke, to Yamaha Hatsudoki Kabushiki Kaisha. Operation control device for in-cylinder injection engine. 5,181,493, Cl. 123-431.000.

Motoyanagi, Teruo, to Kabushiki Kaisha Toshiba. Facsimile apparatus having a rechargeable battery. 5,182,655, Cl. 358-406.000.

Moulinex (Societe Anonyme): *See*—
Bouverie, Alain P. C., 5,181,328, Cl. 34-97.000.

Mouri, Toyohiko: *See*—
Takahashi, Tsutomu; Oshita, Saiichiro; and Mouri, Toyohiko, 5,182,711, Cl. 364-424.050.

Mouri, Yoshitaka, to NEC Corporation. Printed wiring board with test pattern for through holes. 5,182,421, Cl. 174-250.000.

Mourioux, Gilles: *See*—
Benoit, Marc; Brayer, Jean-Louis; Demoute, Jean-Pierre; Mourioux, Gilles; and Taliani, Laurent, 5,182,295, Cl. 514-365.000.

Mueckl, Jerry W.: *See*—
Braun, Robert D.; Crass, Matthew M.; Piehl, James R.; Schend, David J.; Wollert, Gary S.; Mueckl, Jerry W.; and Becker, Thomas P., 5,182,512, Cl. 324-175.000.

Mueller, Mark D.; Jones, Frank L.; Quintana, Julio M.; Ruddy, Kenneth E.; and Mims, Michael G., to Union Oil Company of California. Well casing flotation device and method. 5,181,571, Cl. 166-381.000.

Mueller, Richard L.; Farley, Brian E.; and Pfeiffer, James F., to Devices for Vascular Intervention, Inc. Atherectomy device with angioplasty balloon and method. 5,181,920, Cl. 606-159.000.

Mukaeda, Satoshi: *See*—
Handa, Kiyoji; Mukaeda, Satoshi; Kanai, Hideyuki; Yamashita, Yohachi; Furukawa, Osamu; and Harata, Mitsuo, 5,182,695, Cl. 361-321.000.

Mukai, Hiromu; and Sugihara, Yasumasa, to Minolta Camera Co., Ltd. Finder optical system. 5,182,672, Cl. 359-652.000.

Mukai, Nobuhiro: *See*—
Yamamoto, Naoki; Mukai, Nobuhiro; Ige, Hitoshi; and Atarashi, Junko, 5,182,332, Cl. 525-305.000.

Mulaskey, Bernie F.: *See*—
Miller, Stephen J.; and Mulaskey, Bernie F., 5,182,012, Cl. 208-137.000.

Muller, Hanns P.: *See*—
Giesecke, Henning; Wolf, Gerhard D.; Muller, Hanns P.; von Gizycki, Ulrich; and Wienkenhover, Martin, 5,182,135, Cl. 427-98.000.

Muller, Hans: *See*—
Rodi, Anton; Hauck, Dieter; May, Karl-Heinz; and Muller, Hans, 5,182,803, Cl. 395-575.000.

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Multifastener Corporation: *See*—
Goodsmith, Dale H., 5,181,315, Cl. 29-798.000.

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Muno, Paul. Motor vehicle trailer with counterbalancing weights. 5,181,760, Cl. 296-181.000.

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Hyoi, Isao, 5,182,587, Cl. 351-124.000.

Murai, Mikio; Takahashi, Kiyoshi; Odagiri, Masaru; Kai, Yoshiaki; Suzuki, Takashi; and Kunieda, Toshiaki, to Matsushita Electric Industrial Co., Ltd. Magnetic recording medium and method for making it. 5,182,132, Cl. 427-577.000.

Muraki, Masato, to Canon Kabushiki Kaisha. Method of detecting relative positional deviation between two objects. 5,182,455, Cl. 250-548.000.

Murase, Teruo: *See*—
Nishihara, Mikio; Murase, Teruo; Seyama, Kiyotaka; Kuwabara, Kiyoshi; and Ohshima, Osamu, 5,181,317, Cl. 29-401.100

Murata Mfg. Co., Ltd.: *See*—
Ohtsu, Shinji, 5,182,487, Cl. 313-440.000.
Wakino, Kikuo; and Fukutani, Iwao, 5,181,864, Cl. 439-620.000.

Murayama, Chisei: *See*—
Takagi, Kazo; Nakamura, Shigeoki; and Murayama, Chisei, 5,182,007, Cl. 204-147.000.

Murib, Jawad H.; and Damle, Pradeep D., to Quantum Chemical Corporation. Foaming agent with alcohol activator and method for producing non-chalking polymers. 5,182,058, Cl. 264-54.000.

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Murphy, William J.; and Shaw, David H., to Exxon Research and Engineering Company. Upgrading of low value hydrocarbons using a hydrogen donor and microwave radiation. 5,181,998, Cl. 204-157.150.

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Allwin, Roger P.; and Agnew, James W., 5,181,570, Cl. 166-381.000.

Mylari, Banavara L.; and Zembrowski, William J., to Pfizer Inc. Process and intermediates for the preparation of oxophthalazinyl acetic acids and analogs thereof. 5,182,391, Cl. 544-236.000.

N.E. Chemcat Corporation: *See*—
Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, 5,182,140, Cl. 427-230.000.

Nagai, Shigeki; Sato, Haruo; and Karube, Nagahisa, to Honshu Paper Co., Ltd. High-concentration starch adhesive. 5,181,959, Cl. 106-211.000.

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Tamura, Shinichi; Kurata, Takeshi; Aizawa, Chikara; and Nagamine, Takashi, 5,182,109, Cl. 424-92.000.

Nagamune, Akio; Tezuka, Kouichi; Komine, Isamu; Kuriyama, Shinji; Komatani, Masaki; and Inoue, Akihiko, to NKK Corporation. In-furnace slag level measuring method and apparatus therefor. 5,182,565, Cl. 342-124.000.

Nagano, Akihiko: *See*—
Suda, Yasuo; Nagano, Akihiko; and Konishi, Kazuki, 5,182,443, Cl. 250-201.200.

Nagao, Tomio: *See*—
Ohta, Kiyohiko; Kamiya, Kaoru; Watanabe, Keiko; Nakagawa, Makoto; and Nagao, Tomio, 5,181,604, Cl. 206-5.100.

Nagaoka, Kenji: *See*—
Abe, Hiroomi; Nagaoka, Kenji; Nishio, Taichi; Shinonaga, Hideo; and Sanada, Takashi, 5,182,336, Cl. 525-132.000.

Nagasawa, Tsugio; Shuto, Tadashi; Matsumoto, Toshiaki; Sakuraya, Hideo; and Nishimoto, Shoji, to Unitika Ltd. Film for a thermal transfer ink ribbon. 5,182,252, Cl. 503-227.000.

Nagashima, Akira: *See*—
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.

Nagashima, Yoshitake: *See*—
Kato, Motoi; and Nagashima, Yoshitake, 5,182,575, Cl. 346-108.000.

Nagel, Jon L.: *See*—
Nysen, Paul A.; and Nagel, Jon L., 5,182,570, Cl. 343-795.000.

Nahamoo, David: *See*—
Bahl, Lalit R.; Picheny, Michael A.; Nahamoo, David; and de Souza, Peter V., 5,182,773, Cl. 381-41.000.

Naito, Sakae: *See*—
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Shuji; Nakajima, Ryoichi; and Naito, Sakae, 5,182,011, Cl. 208-39.000.

Najjar, Mitri S.; and Hultman, Carl A., to Texaco Inc. Membrane and separation process. 5,181,941, Cl. 55-16.000.
Nakagawa, Makoto: *See*—
Ohta, Kiyohiko; Kamiya, Kaoru; Watanabe, Keiko; Nakagawa, Makoto; and Nagao, Tomio, 5,181,604, Cl. 206-5.100.
Nakagomi, Hiroshi: *See*—
Kashimura, Makoto; Nakagomi, Hiroshi; Karita, Seiichiro; Fukuda, Tsuguhiro; Kimura, Tetsuo; Hirano, Hirofumi; and Kurata, Mitsuru, 5,182,581, Cl. 346-140.00R.
Nakahama, Kazuo; Kaisho, Yoshihiko; and Yoshimura, Koji, to Takeda Chemical Industries, Ltd. Method for increasing gene expression using protease deficient yeasts. 5,182,195, Cl. 435-69.100.
Nakai, Hideo; Yamada, Koichiro; Nomura, Shumihiro; Matsumoto, Mamoru; and Iwata, Hiroshi, to Tanabe Seiyaky Co., Ltd. Naphthyloxazolidone derivatives. 5,182,296, Cl. 514-376.000.
Nakai, Hideyuki: *See*—
Tomiyasu, Hiroshi; Kobayashi, Yoshiko; Goto, Kiyoshi; Yamamoto, Takeshi; and Nakai, Hideyuki, 5,182,183, Cl. 430-165.000.
Nakajima, Masao: *See*—
Sekiguchi, Akira; Nakajima, Masao; Kurihara, Kazumasa; and Arai, Kenji, 5,182,755, Cl. 371-16.300.
Nakajima, Ryoichi: *See*—
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Nakakubo, Katsuya: *See*—
Maruyama, Masao; Kozakura, Nobuto; and Nakakubo, Katsuya, 5,181,889, Cl. 474-110.000.
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Fukunaga, Yasuyuki; Kita, Hideki; Nakakuma, Akira; Taniguchi, Toru; Fukui, Hidehiro; and Takemura, Yoshinobu, 5,182,584, Cl. 346-157.000.
Nakamoto, Kouji: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.
Nakamura, Kazuhiro, to Sanshin Kogyo Kabushiki Kaisha. Charging system. 5,182,510, Cl. 322-21.000.
Nakamura, Keiji: *See*—
Kime, Kenjiro; Egusa, Naoyuki; and Nakamura, Keiji, 5,182,739, Cl. 369-44.150.
Nakamura, Ken-ichi: *See*—
Ikeda, Naoyasu; and Nakamura, Ken-ichi, 5,182,661, Cl. 359-54.000.
Nakamura, Kenichi: *See*—
Okada, Tadao; Ikeno, Hajime; Ozeki, Yuji; Higaki, Yoshikazu; Matsubara, Koshi; and Nakamura, Kenichi, 5,182,349, Cl. 526-265.000.
Nakamura, Kiyoshi: *See*—
Suzuki, Masato; Inaba, Hiromi; Takenaga, Hiroshi; Yamazaki, Masachika; Oonuma, Naoto; Nakamura, Kiyoshi; Sakai, Yoshio; Yoneda, Kenji; Nakata, Naofumi; and Kasai, Syoji, 5,182,776, Cl. 382-14.000.
Nakamura, Satoshi: *See*—
Iizuka, Tetsuya; Yonemoto, Kazuya; Wada, Kazushi; Nakamura, Satoshi; and Harada, Koichi, 5,182,622, Cl. 257-231.000.
Nakamura, Shigeoki: *See*—
Takagi, Kazo; Nakamura, Shigeoki; and Murayama, Chisei, 5,182,007, Cl. 204-147.000.
Nakamura, Teruo: *See*—
Matsuzawa, Shigeji; Yuasa, Eiji; Tanaka, Junichiro; and Nakamura, Teruo, 5,182,138, Cl. 427-157.000.
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, to Shiseido Company, Ltd. Magnesium aluminometasilicate coated composite powder and use thereof. 5,182,103, Cl. 424-78.030.
Nakanishi, Eiichi; and Onodera, Tetsuo, to Oki Electric Industry Co., Ltd. Power amplifying apparatus for wireless transmitter. 5,182,527, Cl. 330-285.000.
Nakano, Eiichi: *See*—
Kajiyama, Naoki; Masuda, Tsutomu; Tatsumi, Hiroki; and Nakano, Eiichi, 5,182,202, Cl. 435-189.000.
Nakano, Minoru; and Ncmura, Toshio, to Sumitomo Electric Industries, Ltd. Coated cemented carbides and processes for the production of same. 5,181,953, Cl. 75-237.000.
Nakano, Yoshihisa: *See*—
Takahashi, Mitsuhiko; Miyata, Hirofumi; Yuki, Shinya; Nonaka, Keizo; Nakano, Yoshihisa; Mitsuhashi, Hiroshi; Yamaguchi, Katsuya; and Yoshida, Yasuhiko, 5,181,888, Cl. 474-101.000.
Nakano, Yuji; and Hamatani, Fumikazu, to Nitsuko Corporation. Digital telephone set capable of being simultaneously used by a plurality of persons by using one transmission line. 5,182,768, Cl. 379-387.000.
Nakashima, Hisaharu; Hayasaki, Hiroyuki; Suzuki, Masami; Saito, Yoshinori; and Matuyama, Hisasi, to Sanyo Electric Co., Ltd. Color still picture transmission system. 5,182,635, Cl. 358-12.000.
Nakata, Naofumi: *See*—
Suzuki, Masato; Inaba, Hiromi; Takenaga, Hiroshi; Yamazaki, Masachika; Oonuma, Naoto; Nakamura, Kiyoshi; Sakai, Yoshio; Yoneda, Kenji; Nakata, Naofumi; and Kasai, Syoji, 5,182,776, Cl. 382-14.000.
Nakata, Yoshinori, to Fanuc Ltd. Laser beam machining method. 5,182,434, Cl. 219-121.720.
Nakatani, Keiji: *See*—
Tsuboi, Toshio; Moriya, Shigeru; and Nakatani, Keiji, 5,182,638, Cl. 358-80.000.
Nakatsugawa, Tomomi: *See*—
Sakaki, Mamoru; Nakatsugawa, Tomomi; and Sato, Hiroshi, 5,182,175, Cl. 428-537.500.
Nakayama, Hiroshi; Kojima, Keiji; and Sato, Gen, to Ricoh Company, Ltd. Method for extracting feature quantities of a character. 5,182,777, Cl. 382-18.000.
Nakayama, Takahiro: *See*—
Taguchi, Kazuo; Onisawa, Kenichi; Fuyama, Moriaki; Tamura, Katsumi; Abe, Yoshio; Nakayama, Takahiro; Hashimoto, Kenichi; and Sato, Akira, 5,182,491, Cl. 313-503.000.
Nakayama, Toshiki, to Canon Kabushiki Kaisha. Photoelectric converting apparatus with maximum and minimum accumulation detecting. 5,182,447, Cl. 250-208.100.
Nakayama, Toshio: *See*—
Yamamoto, Masanori; Nakayama, Toshio; Fujii, Osamu; and Okabe, Rie, 5,182,206, Cl. 435-253.300.
Nakazawa, Takashi; Ohshima, Minoru; Ishikawa, Masami; Ogawa, Tsukasa; Miyasaka, Tohru; and Umeda, Takao, to Hitachi Koki Co., Ltd.; and Hitachi Ltd. Device for measuring surface potentials at photosensitive body and electrostatic recording apparatus using said device. 5,182,596, Cl. 355-203.000.
Nakazawa, Tetsuo: *See*—
Gotoh, Yoshitaka; Kikuchi, Shigeru; Nakazawa, Tetsuo; Miyoshi, Tadahiko; Oyama, Tetsuo; Ozawa, Yoshihiro; and Itoh, Shinichi, 5,182,075, Cl. 376-150.000.
Nakos, Steven T.: *See*—
Jacobine, Anthony F.; and Nakos, Steven T., 5,182,360, Cl. 528-205.000.
Nalco Chemical Company: *See*—
Gross, Anthony E.; and Passantino, Nancy L., 5,181,957, Cl. 75-772.000.
Nalesnik, Theodore E.: *See*—
Benfarmeo, Nicholas; and Nalesnik, Theodore E., 5,182,041, Cl. 252-51.50A.
Namba, Toyoaki: *See*—
Okada, Kenji; and Namba, Toyoaki, 5,181,709, Cl. 271-97.000.
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Yamamoto, Hiranaga; Takata, Souichi; Wakuda, Osamu; and Namba, Toyoaki, 5,181,706, Cl. 271-11.000.
Nanao, Shingo: *See*—
Honma, Kazuhiro; Watanabe, Kunio; Morita, Takeshi; and Nanao, Shingo, 5,181,860, Cl. 439-321.000.
Nanba, Tomiyuki: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.
Napoli, Phillip D.; and Koshoffer, John M., to General Electric Company. Damped combustor cowl structure. 5,181,377, Cl. 60-39.310.
Nash, Ian A., to Automotive Products plc. Clutch assembly. 5,181,594, Cl. 192-70.270.
Nash-Stevenson, Shelia K.; and Stockbridge, Dennis M., to Hughes Aircraft Company. Optical fiber holder. 5,182,789, Cl. 385-137.000.
Nath, Prem; and Vogeli, Craig, to United Solar Systems Corporation. Photovoltaic device having an improved collector grid. 5,181,968, Cl. 136-256.000.
National Institute of Health: *See*—
Tamura, Shinichi; Kurata, Takeshi; Aizawa, Chikara; and Nagamine, Takashi, 5,182,109, Cl. 424-92.000.
National Research Council of Canada: *See*—
Elias, Lorne; Lawrence, Andre H.; and Lemon, Francis W., 5,181,427, Cl. 73-863.120.
National Research Development Corporation: *See*—
Binns, Matthew M.; Boursnell, Michael E. G.; Campbell, Joan I. A.; and Tomley, Fiona M., 5,182,210, Cl. 435-320.100.
National Semiconductor Corp.: *See*—
Wright, Michael E., 5,182,462, Cl. 307-43.000.
Navarrete, David R.: *See*—
Creasman, Edwin A.; Paul, Thomas R.; Weber, Kenneth E.; Navarrete, David R.; McCullough, Jimmy D.; and Soodjinda, Churchai T., 5,182,053, Cl. 264-1.400.
Nayar, Bala C.: *See*—
Morrall, Stephen W.; Gosselink, Eugene P.; Pan, Robert Y.; and Nayar, Bala C., 5,182,043, Cl. 252-174.000.
NCM International, Inc.: *See*—
Kuhlman, Marvin G.; Finkiewicz, Daniel J.; and Gradecki, Raymond J., 5,181,464, Cl. 101-28.000.
NCR Corporation: *See*—
Campbell, Mark D., 5,182,805, Cl. 395-650.000.
Hain, David A., 5,182,722, Cl. 364-551.010.
Neal, Arthur H.: *See*—
Cody, Ian A.; Dumfries, David H.; Neal, Arthur H.; and Riley, Kenneth L., 5,182,248, Cl. 502-230.000.
NEC Corporation: *See*—
Ando, Koichi, 5,182,472, Cl. 307-446.000.
Hinooka, Kiyonobu, 5,182,621, Cl. 257-546.000.
Ikeda, Naoyasu; and Nakamura, Ken-ichi, 5,182,661, Cl. 359-54.000.

Koumoto, Yasuhiko; and Maemura, Koji, 5,182,754, Cl. 371-68.300.
Mizuse, Harumi; and Kawata, Kazuhide, 5,182,807, Cl. 395-700.000.
Mouri, Yoshitaka, 5,182,421, Cl. 174-250.000.
Sano, Yoshio, 5,182,489, Cl. 313-485.000.

Necker, Thomas: *See—*
Merkel, Gerd; Vogt, Wilfried; Glaunsinger, Georg; Stadler, Peter; Zander, Claus-Peter; Maass, Jurgen; Schmitt, Gernot; Necker, Thomas; and Becker, Willi, 5,181,469, Cl. 101-415.100.

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Kerkenaar, Antonius; Schmedding, Diederik J. M.; and Berg, Jan, 5,182,194, Cl. 435-130.000.

Neff, Charles. Article and a method for producing an article having a high friction surface. 5,181,939, Cl. 51-298.000.

Negishi, Kazuaki, to Fukuda Denshi Co., Ltd. Method and apparatus for measuring blood pressure. 5,181,515, Cl. 128-672.000.

Nelson & Associates Research, Inc.: *See—*
Nelson, Jerry L., 5,182,079, Cl. 420-87.000.

Nelson, Carl; and Wang, Jia-Tarng, to Linear Technology Corporation. Push-back junction isolation semiconductor structure and method. 5,182,219, Cl. 437-27.000.

Nelson, Carl T., to Linear Technology Corporation. Differential input amplifier stage with frequency compensation. 5,182,526, Cl. 330-257.000.

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Nelson, Joyce K.: *See—*
Bikson, Benjamin; Macheras, James T.; and Nelson, Joyce K., 5,181,940, Cl. 55-16.000.

Nelson, Keith E.: *See—*
Knapp, James H.; and Nelson, Keith E., 5,182,071, Cl. 264-272.130.

Nelson, Stephen: *See—*
Steitz, Richard R.; Christie, Diane M.; Neumann, Eugene F.; August, Melvin C.; and Nelson, Stephen, 5,182,420, Cl. 174-52.400.

Nemoto, Takeo: *See—*
Saho, Norihide; Nemoto, Takeo; and Saeki, Mitsuru, 5,181,385, Cl. 62-51.100.

Neste Oy: *See—*
Jovero, Olli, 5,181,747, Cl. 285-21.000.

Neubert, Sophie: *See—*
Lehureau, Jean-Claude; and Neubert, Sophie, 5,182,781, Cl. 385-33.000.

Neugebauer, Alfred, to Develop Dr. Eisbein GmbH & Co. Paper tray for a copying machine. 5,181,713, Cl. 271-160.000.

Neumann, Eugene F.: *See—*
Steitz, Richard R.; Christie, Diane M.; Neumann, Eugene F.; August, Melvin C.; and Nelson, Stephen, 5,182,420, Cl. 174-52.400.

Neumann, Klaus: *See—*
Sitte, Hellmuth; Hassig, Helmut; Kunz, Armin; and Neumann, Klaus, 5,181,443, Cl. 83-72.000.

Neumeyer, Stefan. Mechanical connecting elements. 5,181,850, Cl. 433-205.000.

Neurogen Corporation: *See—*
Albaugh, Pamela, 5,182,290, Cl. 514-293.000.
Albaugh, Pamela; and Hutchinson, Alan J., 5,182,386, Cl. 540-350.000.

Newman, John R.: *See—*
Indelicato, Joseph A., 5,181,682, Cl. 248-210.000.

Newtron Products Company: *See—*
Adelman, Roger; and Duty, Michael S., 5,182,542, Cl. 340-521.000.

Nezu, Masahiro, to Kabushiki Kaisha Shoun Kosakusho. Device for machining a non-circular sectioned workpiece. 5,181,442, Cl. 82-19.000.

NGK Insulators, Ltd.: *See—*
Hirai, Takami; and Yano, Shinsuke, 5,182,240, Cl. 501-139.000.
Kawasaki, Shinji; Kajita, Masaharu; and Matsuhiro, Keiji, 5,182,059, Cl. 264-65.000.

NGK Spark Plug Co., Ltd.: *See—*
Taniguchi, Masato; Yagi, Juzo; and Takeda, Hiroshi, 5,181,691, Cl. 251-315.000.

Nguyen, Liem T.: *See—*
Askew, James D.; Chao, Chin-Wang; Cochran, David R.; Dollard, Peter M.; Eslambolchi, Hossein; Goodson, William E.; Guenther, Robert P.; Mansour, Omar M.; Nguyen, Liem T.; and Tanuku, Sarma S., 5,182,744, Cl. 370-16.000.

Nichiban Company, Limited: *See—*
Ono, Kiyoshi; Kishimoto, Yoshio; and Satou, Tetsuhito, 5,182,133, Cl. 427-516.000.

Nickolls, Peter; Lu, Richard M. T.; Collins, Kenneth A.; McCulloch, Roy M.; Cheatle, Lucy M.; and Cleland, Brian, to Telectronics Pacing Systems, Inc. Apparatus and method for antitachycardia pacing using a virtual electrode. 5,181,511, Cl. 128-419.0PG.

Niehaus, Jeffrey A.: *See—*
Ovens, Kevin M.; and Niehaus, Jeffrey A., 5,182,223, Cl. 437-60.000.

Nielsen, Flemming E.: *See—*
Jorgensen, Anker S.; Stidsen, Carsten E.; Faarup, Peter; Gronvald, Frederik C.; and Nielsen, Flemming E., 5,182,279, Cl. 514-250.000.

Niemiec, Albin J., to Vickers, Incorporated. Electric motor driven inline hydraulic apparatus. 5,181,837, Cl. 417-350.000.

Nietfeld, Georg: *See—*
Krismer, Bruno E.; and Nietfeld, Georg, 5,181,938, Cl. 51-293.000.

Nihon Cement Co., Ltd.: *See—*
Umaki, Yasuhide; Tomita, Rokuro; Hondo, Fumiaki; and Okada, Shigeru, 5,181,961, Cl. 106-724.000.

Nihon Kohden Corporation: *See—*
Sato, Masamitsu; and Tanishima, Masami, 5,181,516, Cl. 128-673.000.

Ninomiya, Ichiro: *See—*
Kiza, Sojiro; Saito, Yutaka; Ninomiya, Ichiro; and Sasho, Hidehiko, 5,182,677, Cl. 360-14.200.

Nins, David V.: *See—*
Tran, Nang T.; Loeding, Neil W.; and Nins, David V., 5,182,624, Cl. 257-40.000.

Nippon Oil Company, Limited: *See—*
Uemura, Seiichi; Sohda, Yoshio; Kato, Osamu; Kouno, Takefumi; and Kihara, Tsutomu, 5,181,979, Cl. 156-89.000.

Nippon Paint Co., Ltd.: *See—*
Matsumura, Akira; and Ishikawa, Katsukiyo, 5,181,984, Cl. 156-630.000.

Nippon Petrochemicals Company, Limited: *See—*
Ishizuka, Hitoharu; and Kubo, Reiko, 5,182,064, Cl. 264-137.000.

Nippon Soken, Inc.: *See—*
Nishida, Minoru; Mizuno, Naohito; Ohtsuka, Yoshinori; Ozaki, Tadashi; and Uesugi, Hiroshi, 5,181,417, Cl. 73-115.000.

Nippon Steel Chemical Co., Ltd.: *See—*
Yamamoto, Toshihiro; Kimura, Masao; and Saito, Keiichi, 5,182,352, Cl. 526-329.200.

Nippon Steel Corporation: *See—*
Shia, Yoshiaki; Mori, Hideaki; Kida, Otojiro; and Taketsugu, Hiroshi, 5,181,779, Cl. 374-139.000.
Tanabe, Hiroto; and Yamazaki, Kazumasa, 5,181,974, Cl. 148-320.000.
Ueda, Masanori; Tsuchinaga, Masamitsu; Iura, Teruo; and Fujiwara, Shigeru, 5,181,970, Cl. 148-610.000.
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Nippon Telegraph and Telephone Corporation: *See—*
Tomimuro, Hisashi; Ishitsuka, Fuminori; Sato, Nobuo; and Osaki, Takaaki, 5,182,631, Cl. 257-664.000.

Nippon Television Network Corp.: *See—*
Kimata, Yoshihide; Yasuki, Seijiro; Ogawa, Yoshihiko; and Kawai, Kiyoyuki, 5,182,644, Cl. 358-140.000.

Nippon Thompson Co., Ltd.: *See—*
Morita, Kunihiko, 5,181,780, Cl. 384-8.000.

Nippon Unicar Company Limited: *See—*
Tsukada, Kiroku; and Kotani, Kunio, 5,182,072, Cl. 264-349.000.

Nippondenso Co., Ltd.: *See—*
Nishida, Minoru; Mizuno, Naohito; Ohtsuka, Yoshinori; Ozaki, Tadashi; and Uesugi, Hiroshi, 5,181,417, Cl. 73-115.000.
Saburi, Toshiki; Fujimoto, Masaya; Tsuruta, Tadashi; and Nunogaki, Naochika, 5,182,136, Cl. 427-126.300.
Yoshimi, Tomohisa; Iwama, Shinji; Kajino, Yuuichi; and Sugi, Hikaru, 5,181,654, Cl. 236-91.00C.

Nisato, Dino: *See—*
Gubin, Jean; Chatelain, Pierre; Descamps, Marcel; Nisato, Dino; Inion, Henri; Lucchetti, Jean; Mahaux, Jean-Marie; and Vallat, Jean-Noel, 5,182,291, Cl. 514-300.000.

Nishida, Minoru; Mizuno, Naohito; Ohtsuka, Yoshinori; Ozaki, Tadashi; and Uesugi, Hiroshi, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Pressure detecting device. 5,181,417, Cl. 73-115.000.

Nishihara, Mikio; Murase, Teruo; Seyama, Kiyotaka; Kuwabara, Kiyoshi; and Ohshima, Osamu, to Fujitsu Limited. Method of making an engineering change to a printed wiring board. 5,181,317, Cl. 29-401.100.

Nishikubo, Tadaomi, to Research Development Corporation of Japan. Material for light-heat energy accumlation and conversion. 5,182,320, Cl. 524-88.000.

Nishimoto, Kichinosuke: *See—*
Kumagai, Yuzo; and Nishimoto, Kichinosuke, 5,181,982, Cl. 156-415.000.

Nishimoto, Shoji: *See—*
Nagasawa, Tsugio; Shuto, Tadashi; Matsumoto, Toshiaki; Sakuraya, Hideo; and Nishimoto, Shoji, 5,182,252, Cl. 503-227.000.

Nishimura, Toshifumi, to Hitachi, Ltd. Information recording/reproducing method and magnetic tape subsystem employing the same. 5,182,679, Cl. 360-48.000.

Nishio, Taichi: *See—*
Abe, Hiroomi; Nagaoka, Kenji; Nishio, Taichi; Shinonaga, Hideo; and Sanada, Takashi, 5,182,336, Cl. 525-132.000.

Nishiwaki, Osamu: *See—*
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.

Nisizawa, Akinori: *See—*
Koga, Keiji; Satoh, Jun-ichi; Yokoyama, Kenji; Nisizawa, Akinori; and Tokuoka, Yasumichi, 5,182,693, Cl. 360-135.000.

Nissan Morot Co., Ltd.: *See—*
Maruyama, Junichi; Fukumura, Teruo; and Kawaguchi, Sadatsugu, 5,181,575, Cl. 173-180.000.

Nissan Motor Company, Limited: *See—*
Doi, Koichi, 5,181,553, Cl. 165-22.000.
Kokubun, Hitoshi, 5,181,736, Cl. 280-719.000.
Sakamoto, Hiroki; Matsuyama, Hidenobu; and Shibata, Kimihiro, 5,182,433, Cl. 219-121.850.

Nissei Asb Machine Co., Ltd.: *See*—
Uehara, Shinichi; Satou, Kouichi; and Baba, Seigo, 5,182,122, Cl. 425-526.000.
Nisshin Flour Milling Co., Ltd.: *See*—
Ogawa, Osamu; Kishi, Ikuo; Tahara, Yoshiyuki; and Sugita, Masanori, 5,182,267, Cl. 514-34.000.
Tachibana, Yoji, 5,182,396, Cl. 552-653.000.
Nisshinbo Industries, Inc.: *See*—
Yasuda, Go; and Wada, Akira, 5,182,061, Cl. 264-72.000.
Nitsuko Corporation: *See*—
Nakano, Yuji; and Hamatani, Fumikazu, 5,182,768, Cl. 379-387.000.
Nitto Kohki Co., Ltd.: *See*—
Makishima, Reichi, 5,181,689, Cl. 251-149.600.
Niwa, Masaaki; and Okada, Shozo, to Matsushita Electric Industrial Co. Ltd. Method for determining the presence of thin insulating films. 5,182,452, Cl. 250-307.000.
NKK Corporation: *See*—
Nagamune, Akio; Tezuka, Kouichi; Komine, Isamu; Kuriyama, Shinji; Komatani, Masaki; and Inoue, Akihiko, 5,182,565, Cl. 342-124.000.
Yoshioka, Osami; Matsui, Naoki; Sato, Hiroaki; Omori, Kouji; Yamazaki, Masayuki; Suzuki, Masafumi; Oishi, Hitoshi; Kitagawa, Naoto; Seike, Takaya; and Araki, Yasuhiro, 5,182,074, Cl. 266-87.000.
Noble, David: *See*—
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 5,182,207, Cl. 435-253.500.
Noble, Hazel M.: *See*—
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 5,182,207, Cl. 435-253.500.
Noble, John W. Apparatus and system for storing and collecting separated solid waste. 5,181,619, Cl. 209-702.000.
Noboru, Fujino: *See*—
Ushiki, Hiroshi; and Noboru, Fujino, 5,181,646, Cl. 228-4.500.
Noda, Touru; Tsubaki, Masayuki; Sakai, Yasunosuke; Ashida, Tetsuya; and Matsuda, Hiroshi, to Mitsubishi Paper Mills Limited. Support for photosensitive materials. 5,182,161, Cl. 428-195.000.
Nogossek, Alfred; and Keilert, Jurgen, to Automatik Apparate-Maschinenbau GmbH. Device for cooling, drying and granulating strands. 5,182,115, Cl. 425-71.000.
Noguchi, Kenji: *See*—
Andoh, Nobuaki; Kohda, Kenji; Toyama, Tsuyoshi; Noguchi, Kenji; and Kobayashi, Shinichi, 5,182,725, Cl. 365-185.000.
Nomura, Hiroshi, to Sanyo Electric Co., Ltd. Variable band-pass filter circuit. 5,182,478, Cl. 307-521.000.
Nomura, Shumihiro: *See*—
Nakai, Hideo; Yamada, Koichiro; Nomura, Shumihiro; Matsumoto, Mamoru; and Iwata, Hiroshi, 5,182,296, Cl. 514-376.000.
Nomura, Toshio: *See*—
Nakano, Minoru; and Nomura, Toshio, 5,181,953, Cl. 75-237.000.
Nonaka, Keizo: *See*—
Takahashi, Mitsuhiko; Miyata, Hirofumi; Yuki, Shinya; Nonaka, Keizo; Nakano, Yoshihisa; Mitsuhashi, Hiroshi; Yamaguchi, Katsuya; and Yoshida, Yasuhiko, 5,181,888, Cl. 474-101.000.
Nonnenmacher, Ronald C.; Schulz, Kathleen; Lewis, Richard C.; and Riley, Richard, to United Technologies Automotive. Method of making a variable power resistor. 5,181,313, Cl. 29-620.000.
Noone, Michael J.: *See*—
Hannah, Marcia G.; Mehrer, George W.; Noone, Michael J.; Stahl, Kermit E.; and Quaranta, Joseph, 5,181,361, Cl. 52-535.000.
Norand Corporation: *See*—
Chadima, George E., Jr.; and Laser, Vadim, 5,182,441, Cl. 235-472.000.
Nordiskafilt AB: *See*—
Eklund, Nils O.; Olsson, Johan L.; and Strom, Lars-Magnus, 5,182,164, Cl. 428-234.000.
Norfolk Southern Railway Co.: *See*—
Powell, Charles S., 5,181,327, Cl. 33-833.000.
Norman, Thomas J., Jr.; Ingram, James R., Jr.; and Lin, Joel Y., to BanTec, Inc. Ribbon saving control mechanism. 5,181,788, Cl. 400-232.000.
Noro, Yukio: *See*—
Asahi, Masaki; and Noro, Yukio, 5,182,362, Cl. 528-486.000.
North, Sandra S.: *See*—
Bales, Bruce M.; Crumpley, Robert L.; North, Sandra S.; and Thieler, Stephen M., 5,182,750, Cl. 370-110.100.
Bales, Bruce M.; Crumpley, Robert L.; North, Sandra S.; and Thieler, Stephen M., 5,182,751, Cl. 370-110.100.
Norton, Paul R., to Santa Barbara Research Center. Method of fabricating a trapping-mode. 5,182,217, Cl. 437-5.000.
Nose, Noriyuki: *See*—
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Mizusawa, Nobutoshi; Suda, Shigeyuki; Nose, Noriyuki; and Kariya, Takao, 5,182,615, Cl. 356-400.000.
Notagashira, Hidefumi; and Akutsu, Tsuyoshi, to Canon Kabushiki Kaisha. Optical apparatus. 5,182,674, Cl. 359-694.000.
Notthakun, Sawang: *See*—
Crittenden, John C.; Notthakun, Sawang; Hand, David W.; and Perram, David L., 5,182,030, Cl. 210-748.000.
Novo Nordisk A/S: *See*—
Jorgensen, Anker S.; Stidsen, Carsten E.; Faarup, Peter; Gronvald, Frederik C.; and Nielsen, Flemming E., 5,182,279, Cl. 514-250.000.
Ward, John S., 5,182,283, Cl. 514-254.000.
Nowak, Matthew M.; Rothenberger, Roland D.; and Vinson, Mark A., to Unisys Corporation. Integrated circuit die having a power distribution system for at least ten-thousand bipolar logic cells. 5,182,629, Cl. 257-577.000.
Nozaki, Kenji: *See*—
Suzuki, Masahiro; Nozaki, Kenji; Kajitani, Makoto; Yasumoto, Mitsugi; Ono, Naohiko; and Shindo, Takashi, 5,182,284, Cl. 514-255.000.
Nuber, Bernd: *See*—
Viebach, Thomas; Kreibich, Rainer; Nuber, Bernd; Pauker, Robert; and Hesse, Alexander, 5,181,512, Cl. 128-660.030.
Nucida, Gilberto: *See*—
Cipolli, Roberto; Oriani, Roberto; Nucida, Gilberto; and Masarati, Enrico, 5,182,388, Cl. 544-195.000.
Nuijten, Petrus A. C. M.: *See*—
Behagel, Frank P.; Poorter, Tiemen; and Nuijten, Petrus A. C. M., 5,182,479, Cl. 307-571.000.
Nunogaki, Naochika: *See*—
Saburi, Toshiki; Fujimoto, Masaya; Tsuruta, Tadashi; and Nunogaki, Naochika, 5,182,136, Cl. 427-126.300.
N.V. Nederlandsche Apparatenfabriek Nedap: *See*—
Hujink, Hendrik W., 5,181,786, Cl. 400-61.000.
Nyacol Products Inc.: *See*—
Kintz, Donald P.; and Catone, David L., 5,182,048, Cl. 252-363.500.
Nyman, Bror G.: *See*—
Lilja, Launo L.; Makitalo, Valto J.; Hultholm, Stig-Erik; and Nyman, Bror G., 5,182,087, Cl. 422-228.000.
Nysen, Paul A.; and Nagel, Jon L., to X-Cyte Inc. End fed flat antenna. 5,182,570, Cl. 343-795.000.
Oakes, Roger K.; and Cundiff, Kevin B., to Aladdin Synergetics, Inc. Food service apparatus and process. 5,182,438, Cl. 219-386.000.
O'Callaghan, Michael J.; and Handschy, Mark A., to Displaytech, Inc. Diffractive light modulator. 5,182,665, Cl. 359-95.000.
Oce-Nederland, B.V.: *See*—
Spoorenberg, Christophorus L., 5,181,711, Cl. 271-98.000.
Ochiai, Kiyoshi, to Sumitomo Rubber Industries, Ltd. Tire and rim assembly with the tire having 15 degree taper bead parts. 5,181,978, Cl. 152-341.000.
Ochiai, Kunio: *See*—
Sakata, Shigekazu; Ito, Yasuo; Ochiai, Kunio; and Yamagata, Hisao, 5,182,748, Cl. 370-94.100.
O'Connor, Mark A.: *See*—
O'Connor, Rodney J.; and O'Connor, Mark A., 5,182,023, Cl. 210-652.000.
O'Connor, Rodney J.; and O'Connor, Mark A., to Texas Romec, Inc. Process for removing arsenic from water. 5,182,023, Cl. 210-652.000.
O'Connor, Ronald M.: *See*—
Lapeyre, James M., deceased; Greve, Christopher; and O'Connor, Ronald M., 5,181,879, Cl. 452-160.000.
Odagiri, Masaru: *See*—
Murai, Mikio; Takahashi, Kiyoshi; Odagiri, Masaru; Kai, Yoshiaki; Suzuki, Takashi; and Kunieda, Toshiaki, 5,182,132, Cl. 427-577.000.
O de Portas, Graciela I.: *See*—
Portas, Abelardo A.; and O de Portas, Graciela I., 5,182,096, Cl. 424-45.000.
Oey, Albert: *See*—
Theys, Ezra; Taylor, Russell G.; Bertelsen, Bruce; Oey, Albert; Hoyrup, John; and Knafelc, Frank, 5,181,456, Cl. 99-485.000.
Ogasawara, Takashi: *See*—
Yamauchi, Hiroshige; Ogasawara, Takashi; and Takahashi, Tomotsugu, 5,182,159, Cl. 428-192.000.
Ogawa, Masao: *See*—
Kinaga, Yoshimasa; Ogawa, Masao; and Kiyomura, Yoshihiro, 5,182,786, Cl. 385-128.000.
Ogawa, Osamu; Kishi, Ikuo; Tahara, Yoshiyuki; and Sugita, Masanori, to Lederle (Japan), Ltd.; and Nisshin Flour Milling Co., Ltd. Anticancer activity potentiator. 5,182,267, Cl. 514-34.000.
Ogawa, Tsukasa: *See*—
Nakazawa, Takashi; Ohshima, Minoru; Ishikawa, Masami; Ogawa, Tsukasa; Miyasaka, Tohru; and Umeda, Takao, 5,182,596, Cl. 355-203.000.
Ogawa, Yoshihiko: *See*—
Kimata, Yoshihide; Yasuki, Seijiro; Ogawa, Yoshihiko; and Kawai, Kiyoyuki, 5,182,644, Cl. 358-140.000.
Ogura, Eiji: *See*—
Yamashita, Keitaro; and Ogura, Eiji, 5,182,680, Cl. 360-60.000.
O'Hara, Robert S. Decorative vehicle air speed indicator. 5,182,146, Cl. 428-31.000.
Ohaus, Karl G., to American Standard Inc. Combination molded article with brackets and mold for manufacturing same. 5,182,116, Cl. 425-125.000.
Ohe, Tatsuta, to Mitsui Petrochemical Industries, Ltd. Synthetic resin seamless tube with black portion(s) and through-holes therein. 5,181,659, Cl. 239-556.000.
Ohhashi, Akihito: *See*—
Ashikawa, Noboru; Yaguchi, Bunsho; Yasuda, Toyoshi; Takano, Masami; Ohhashi, Akihito; Shimada, Hiroyuki; and Akioka, Masahiro, 5,181,893, Cl. 475-203.000.
Ohiwa, Kiyoshi, to Fuji Electric Co., Ltd. Plasma processing apparatus. 5,181,986, Cl. 156-643.000.
Ohki, Katsuyoshi: *See*—
Usui, Kazushi; Fujikawa, Takashi; and Ohki, Katsuyoshi, 5,182,250, Cl. 502-314.000.
Ohkoda, Keiji; Kudo, Tomohiro; Shimizu, Satoshi; and Kawasaki, Keiichi, to Canon Kabushiki Kaisha. Sheet conveying unit and syatem using the same. 5,181,715, Cl. 271-272.000.

Ohkubo, Yasuo, to Kabushiki Kaisha Toshiba. Connection polarity switching apparatus. 5,182,466, Cl. 307-127.000.

Ohmi, Kazuaki: *See*—
Kishi, Fumio; Akaike, Masatake; Yamamoto, Keisuke; Motoi, Taiko; Kaneko, Norio; Iwatate, Fujio; Ohmi, Kazuaki; Kawasaki, Takehiko; and Shinjou, Atsuko, 5,182,253, Cl. 505-1.000.

Ohmori, Kiyoshi; Iwaasa, Shoji; and Fujita, Goro, to Sony Corporation. Recording and/or reproducing apparatus with a disc cartridge temperature sensor. 5,182,742, Cl. 369-116.000.

Ohmura, Ken: *See*—
Koizumi, Yoshiaki; Tsujita, Kenji; Kouno, Shigenori; and Ohmura, Ken, 5,182,181, Cl. 430-108.000.

Ohno, Kazuhisa: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Ohshima, Kiyoko: *See*—
Kayashima, Kazuhiro; Tateishi, Fumikazu; and Ohshima, Kiyoko, 5,182,790, Cl. 385-141.000.

Ohshima, Minoru: *See*—
Nakazawa, Takashi; Ohshima, Minoru; Ishikawa, Masami; Ogawa, Tsukasa; Miyasaka, Tohru; and Umeda, Takao, 5,182,596, Cl. 355-203.000.

Ohshima, Osamu: *See*—
Nishihara, Mikio; Murase, Teruo; Seyama, Kiyotaka; Kuwabara, Kiyoshi; and Ohshima, Osamu, 5,181,317, Cl. 29-401.100.

Ohta, Kiyohiko; Kamiya, Kaoru; Watanabe, Keiko; Nakagawa, Makoto; and Nagao, Tomio, to Tomei Sangyo Co., Ltd. Contact lens holder and treating device. 5,181,604, Cl. 206-5.100.

Ohta, Tadao: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Ohtaka, Keiji: *See*—
Ishizaki, Akira; Suzuki, Kenji; Ohtaka, Keiji; and Suda, Yasuo, 5,182,658, Cl. 358-483.000.

Ohtake, Takao: *See*—
Shibayama, Yoshinaru; and Ohtake, Takao, 5,182,796, Cl. 395-156.000.

Ohtsu, Shinji, to Murata Mfg. Co., Ltd. Deflection yoke device. 5,182,487, Cl. 313-440.000.

Ohtsuka, Hiroyuki: *See*—
Mochida, Isao; Sakai, Yukio; and Ohtsuka, Hiroyuki, 5,182,010, Cl. 208-44.000.

Ohtsuka, Naoji, to Canon Kabushiki Kaisha. Magnet and method of manufacturing the same. 5,181,971, Cl. 148-103.000.

Ohtsuka, Yoshihiro; and Masuda, Yoshifumi, to Sharp Kabushiki Kaisha. Photocoupler with improved anti-noise characteristics. 5,182,448, Cl. 250-214.00B.

Ohtsuka, Yoshinori: *See*—
Nishida, Minoru; Mizuno, Naohito; Ohtsuka, Yoshinori; Ozaki, Tadashi; and Uesugi, Hiroshi, 5,181,417, Cl. 73-115.000.

Ohue, Michio: *See*—
Fukuda, Takuya; Ohue, Michio; and Sonobe, Tadasi, 5,182,495, Cl. 315-111.410.

Ohyama, Tsukasa: *See*—
Takuma, Keisuke; Ohyama, Tsukasa; Igata, Akitoshi; Mikoda, Tamio; Ghoda, Isamu; and Koshida, Hitoshi, 5,182,395, Cl. 552-251.000.

Oishi, Hitoshi: *See*—
Yoshioka, Osami; Matsui, Naoki; Sato, Hiroaki; Omori, Kouji; Yamazaki, Masayuki; Suzuki, Masafumi; Oishi, Hitoshi; Kitagawa, Naoto; Seike, Takaya; and Araki, Yasuhiro, 5,182,074, Cl. 266-87.000.

Oji Paper Co., Ltd.: *See*—
Yamauchi, Hiroshige; Ogasawara, Takashi; and Takahashi, Tomotsugu, 5,182,159, Cl. 428-192.000.

Okabe, Rie: *See*—
Yamamoto, Masanori; Nakayama, Toshio; Fujii, Osamu; and Okabe, Rie, 5,182,206, Cl. 435-253.300.

Okada, Kazuhiro, to Wacoh Corporation. Detector for magnetism using a resistance element. 5,182,515, Cl. 324-259.000.

Okada, Kenji; and Namba, Toyoaki, to Sharp Kabushiki Kaisha. Sheet feeding apparatus. 5,181,709, Cl. 271-97.000.

Okada, Kenji: *See*—
Takata, Souichi; Namba, Toyoaki; Okada, Kenji; and Wakuda, Osamu, 5,181,710, Cl. 271-98.000.

Okada, Kiyoshi, to Mitsubishi Denki K.K. Method for synchronously interlocking feed axes of a lathe. 5,181,441, Cl. 82-1.110.

Okada, Shigeru: *See*—
Umaki, Yasuhide; Tomita, Rokuro; Hondo, Fumiaki; and Okada, Shigeru, 5,181,961, Cl. 106-724.000.

Okada, Shozo: *See*—
Niwa, Masaaki; and Okada, Shozo, 5,182,452, Cl. 250-307.000.

Okada, Shuji: *See*—
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Shuji; Nakajima, Ryoichi; and Naito, Sakae, 5,182,011, Cl. 208-39.000.

Okada, Tadao; Ikeno, Hajime; Ozeki, Yuji; Higaki, Yoshikazu; Matsubara, Koshi; and Nakamura, Kenichi, to Mitsubishi Petrochemical Company, Ltd. Ethylene copolymer and method of producing same. 5,182,349, Cl. 526-265.000.

Okamoto, Futoshi: *See*—
Hiramatsu, Akinori; Okamoto, Futoshi; Kido, Hiroshi; Sako, Hiroyuki; Yamanaka, Yukio; and Yamada, Koji, 5,182,702, Cl. 363-132.000.

Okamoto, Hiroo: *See*—
Hatanaka, Youji; Okamoto, Hiroo; Arai, Takao; Wakumura, Shinichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 5,182,678, Cl. 360-32.000.

Okamura, Kazuyoshi: *See*—
Itoh, Akira; Okamura, Kazuyoshi; and Uchida, Kazuiki, 5,182,486, Cl. 313-25.000.

Okamura, Shigeru, to Canon Kabushiki Kaisha. Ink jet recording apparatus with cleaning means that cleans lighter-ink discharge portions before darker-ink discharge portions. 5,182,582, Cl. 346-140.00R.

Okano, Kazuo: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.

Okano, Masami; and Takeuchi, Kunihiro, to Zexel Corporation. Control system for vehicle safety device. 5,182,459, Cl. 307-10.100.

Okezie, Alozie C. Waste receptacle liner bag. 5,181,628, Cl. 220-404.000.

Oki Electric Industry Co., Ltd.: *See*—
Nakanishi, Eiichi; and Onodera, Tetsuo, 5,182,527, Cl. 330-285.000.

Okorodudu, Abraham O. M.; and Cardis, Angeline B., to Mobil Oil Corp. Borated hydroxyalkyl esters of alkyl- or alkenylsuccinimide-derived dithiocarbamic acids as multifunctional ashless dispersants. 5,182,036, Cl. 252-47.500.

Okubo, Katsuyuki: *See*—
Tsuji, Toshinori; Hosoya, Koichi; Tsukimoto, Fumio; Ashida, Tatsuya; Okubo, Katsuyuki; Bokuhara, Tetsuo; and Shinzo, Toshiaki, 5,181,668, Cl. 242-54.00R.

Okuma Corporation: *See*—
Ieki, Atsushi; Hayashi, Yasukazu; and Matsui, Keiji, 5,182,613, Cl. 356-374.000.

Okumura, Takaaki: *See*—
Matsui, Shigetomo; Uenishi, Masahiro; Iuchi, Sadao; Sugimoto, Kouji; Itoga, Kouyu; Harada, Tetsuzo; Michiba, Kouji; Onda, Katsuhiro; and Okumura, Takaaki, 5,182,775, Cl. 382-8.000.

Okumura, Toshiyuki: *See*—
Taneya, Mototaka; Konushi, Fumihiro; Okumura, Toshiyuki; and Takiguchi, Haruhisa, 5,182,758, Cl. 372-46.000.

Okuno, Takuya: *See*—
Kayukawa, Hiroaki; Kimura, Kazuya; Takenaka, Kenji; and Okuno, Takuya, 5,181,453, Cl. 92-12.200.

Okunuki, Yutaka: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Olejnik, Orest: *See*—
Musson, Donald G.; and Olejnik, Orest, 5,182,270, Cl. 514-58.000.

Olin Corporation: *See*—
Brock, Andrew J.; Lin, Lifun; Menkin, Paul; and Polan, Ned W., 5,181,770, Cl. 205-77.000.

Olivetti-Canon Industriale S.p.A.: *See*—
Perino, Andrea, 5,181,712, Cl. 271-109.000.

Olsen, John D.: *See*—
Thengs, Norvald; and Olsen, John D., 5,181,802, Cl. 405-70.000.

Olsson, Johan L.: *See*—
Eklund, Nils O.; Olsson, Johan L.; and Strom, Lars-Magnus, 5,182,164, Cl. 428-234.000.

Olszewski, John A.: *See*—
Thurman, Dan L.; Slane, Melvin B.; Berndt, Charles F.; and Olszewski, John A., 5,181,375, Cl. 51-287.000.

Omega Engineering, Inc.: *See*—
Hollander, Milton B.; and Jacobs, David R., 5,181,650, Cl. 229-103.000.

Omi, Susumu; and Fujita, Kazuya, to Sharp Kabushiki Kaisha. Semiconductor device having a particular shaped die pad and coated lower surface. 5,182,630, Cl. 257-787.000.

Omni Rubber Products, Inc.: *See*—
Davis, R. Andrew, 5,181,657, Cl. 238-8.000.

Omori, Kouji: *See*—
Yoshioka, Osami; Matsui, Naoki; Sato, Hiroaki; Omori, Kouji; Yamazaki, Masayuki; Suzuki, Masafumi; Oishi, Hitoshi; Kitagawa, Naoto; Seike, Takaya; and Araki, Yasuhiro, 5,182,074, Cl. 266-87.000.

Omron Corporation: *See*—
Sekii, Hiroshi; and Imanaka, Koichi, 5,182,228, Cl. 437-129.000.

Onda, Katsuhiro: *See*—
Matsui, Shigetomo; Uenishi, Masahiro; Iuchi, Sadao; Sugimoto, Kouji; Itoga, Kouyu; Harada, Tetsuzo; Michiba, Kouji; Onda, Katsuhiro; and Okumura, Takaaki, 5,182,775, Cl. 382-8.000.

Ong, Helen H.: *See*—
Schonafinger, Karl; and Ong, Helen H., 5,182,275, Cl. 514-222.800.

Onisawa, Kenichi: *See*—
Taguchi, Kazuo; Onisawa, Kenichi; Fuyama, Moriaki; Tamura, Katsumi; Abe, Yoshio; Nakayama, Takahiro; Hashimoto, Kenichi; and Sato, Akira, 5,182,491, Cl. 313-503.000.

Onishi, Ichiro, to Aprica Kassai Kabushikikaisha. Foldaway baby carriage and folding mechanism employed therein. 5,181,735, Cl. 280-642.000.

Onitsuka, Yoshihiro: *See*—
Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, 5,182,549, Cl. 340-784.000.

Ono, Hisao; Ito, Katsumi; Uekawa, Tatuo; and Ishikawa, Katsuhiro, to Japan Synthetic Rubber Co., Ltd. Homopolymers of sulfonated isoprene and 1,3-butadiene and agents containing the same. 5,182,343, Cl. 526-240.000.

Ono, Kiyoshi; Kishimoto, Yoshio; and Satou, Tetsuhito, to Nichiban Company, Limited. Sealer material and method for applying the same. 5,182,133, Cl. 427-516.000.

Ono, Naohiko: *See*—
Suzuki, Masahiro; Nozaki, Kenji; Kajitani, Makoto; Yasumoto, Mitsugi; Ono, Naohiko; and Shindo, Takashi, 5,182,284, Cl. 514-255.000.

Ono Sokki Co., Ltd.: *See*—
Ono, Takahiko; and Endo, Youichi, 5,181,504, Cl. 128-36.000.

Ono, Takahiko; and Endo, Youichi, to Ono Sokki Co., Ltd.; and Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Vibration generator using rotary bodies having unbalanced weights, and vibratory stimulating apparatus using same vibration generator. 5,181,504, Cl. 128-36.000.

Ono, Yoshiaki, to Tokyo Electric Co., Ltd. Offset printing machine having automatically releasably clamped blanket sheet. 5,181,466, Cl. 101-142.000.

Onodera, Tetsuo: *See*—
Nakanishi, Eiichi; and Onodera, Tetsuo, 5,182,527, Cl. 330-285.000.

Ontario Die Company Limited: *See*—
Piotrowski, Stanley; and Levine, Ronald L, 5,182,065, Cl. 264-153.000.

Ooki, Nobuaki: *See*—
Miyashita, Akimi; Fujii, Mutsumasa; Kubosawa, Minoru; Torii, Keiichiro; Ooki, Nobuaki; Kogawa, Kiyonori; Kawaguchi, Masami; Murooka, Hideyasu; and Kyooi, Masayuki, 5,182,121, Cl. 425-338.000.

Oono, Yetsuya: *See*—
Ishii, Yukihisa; Oono, Yetsuya; and Inagawa, Shinichi, 5,182,507, Cl. 318-685.000.

Oonuma, Naoto: *See*—
Suzuki, Masato; Inaba, Hiromi; Takenaga, Hiroshi; Yamazaki, Masachika; Oonuma, Naoto; Nakamura, Kiyoshi; Sakai, Yoshio; Yoneda, Kenji; Nakata, Naofumi; and Kasai, Syoji, 5,182,776, Cl. 382-14.000.

Oozeer, Rowena C.: *See*—
Wertheim, David F. P.; Oozeer, Rowena C.; Dubowitz, Victor; Connell, John A.; and Brydon, John W. E., 5,181,520, Cl. 128-731.000.

Oppenheim, Paul J., to International Paper Company. Paperboard asparagus carton. 5,181,651, Cl. 229-121.000.

Oppermann, Hermann; Kuberasampath, Thangavel; Rueger, David C.; and Ozkaynak, Engin, to Stryker Corporation. Osteogenic proteins. 5,182,365, Cl. 530-326.000.

Oprysko, Modest M.: *See*—
Donelon, John J.; Doyle, James P.; Hurst, Jerry E., Jr.; Oprysko, Modest M.; Rossnagel, Stephen M.; and von Gutfeld, Robert J., 5,182,230, Cl. 437-173.000.

Opta Food Ingredients, Inc.: *See*—
Haralampu, Stephen G.; Sands, Stephen; and Gross, Akiva, 5,182,130, Cl. 427-3.000.

Optical Radiation Corporation: *See*—
Creasman, Edwin A.; Paul, Thomas R.; Weber, Kenneth E.; Navarrete, David R.; McCullough, Jimmy D.; and Soodjinda, Churchai T., 5,182,053, Cl. 264-1.400.

Orbon Corporation: *See*—
Chiou, George C. Y., 5,182,258, Cl. 514-3.000.

Ori, Aiichiro: *See*—
Kise, Shoichi; Hayashida, Mikio; Ori, Aiichiro; Hiratsuka, Junzou; and Yamada, Hideaki, 5,182,198, Cl. 435-126.000.

Oriani, Roberto: *See*—
Cipolli, Roberto; Oriani, Roberto; Nucida, Gilberto; and Masarati, Enrico, 5,182,388, Cl. 544-195.000.

Oros, Gyula: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 5,182,277, Cl. 514-231.200.

Ortho Pharmaceutical Corporation: *See*—
Murray, William V.; and Wachter, Michael P., 5,182,288, Cl. 514-278.000.

Osada, Takahiro; and Aoki, Yoko, to Mitsubishi Pencil Kabushiki Kaisha. Alcoholic marking ink composition. 5,182,324, Cl. 524-379.000.

Osaka Gas Co., Ltd.: *See*—
Tsuji, Toshinori; Hosoya, Koichi; Tsukimoto, Fumio; Ashida, Tatsuya; Okubo, Katsuyuki; Bokuhara, Tetsuo; and Shinzo, Toshiaki, 5,181,668, Cl. 242-54.00R.

Osaki, Takaaki: *See*—
Tomimuro, Hisashi; Ishitsuka, Fuminori; Sato, Nobuo; and Osaki, Takaaki, 5,182,631, Cl. 257-664.000.

Oscar Mayer Foods Corporation: *See*—
Flisram, Dennis G., 5,181,665, Cl. 241-292.100.
Jalinski, Thomas J., 5,182,212, Cl. 436-2.000.

Oshita, Saiichiro: *See*—
Takahashi, Tsutomu; Oshita, Saiichiro; and Mouri, Toyohiko, 5,182,711, Cl. 364-424.050.

Osiecki, Larry J.: *See*—
Carlos, Joseph M.; Carstensen, Thomas A.; Hall, William J.; and Osiecki, Larry J., 5,182,150, Cl. 428-35.700.

Ostapowicz, Vladimir. Collapsible hanger bar. 5,181,685, Cl. 248-293.000.

Otis Elevator Company: *See*—
Tietze, Walter; and Badstuebner, Hella, 5,181,595, Cl. 198-335.000.
Yoo, Young S.; and Salmon, John K., 5,181,586, Cl. 187-1.00A.

Otis Engineering Corporation: *See*—
McCoy, Brian K.; and Stambaugh, Tommy L., 5,181,569, Cl. 166-317.000.

Ott, Hans: *See*—
Kipphan, Helmut; Loffler, Gerhard; Keller, Guido; and Ott, Hans, 5,182,721, Cl. 364-526.000.

Otto Bock Orthopaedische Industrie Besitz- und Verwaltungs-Kommanditgesellschaft: *See*—
van de Veen, Paul G., 5,181,931, Cl. 623-40.000.

Outokumpu Oy: *See*—
Lilja, Launo L.; Makitalo, Valto J.; Hultholm, Stig-Erik; and Nyman, Bror G., 5,182,087, Cl. 422-228.000.

Outokumpu Research Oy: *See*—
Asteljoki, Jussi A.; Laulumaa, Jukka F.; and Lilja, Launo L., 5,181,955, Cl. 75-443.000.

Output Technology Corporation: *See*—
Blair, Blaise G., 5,181,789, Cl. 400-248.000.

Ovens, Kevin M.; and Niehaus, Jeffrey A., to Texas Instruments Incorporated. Method of making an integrated circuit with capacitor. 5,182,223, Cl. 437-60.000.

Owashi, Yutaka: *See*—
Ozawa, Koichi; Abe, Hajime; and Owashi, Yutaka, 5,182,117, Cl. 425-144.000.

Owens-Corning Fiberglas Technology, Inc.: *See*—
Hager, Thomas P.; and Hendry, Janet A., 5,182,784, Cl. 385-128.000.

Owens, Frank J., to United States of America, Army. Superconducting electromagnetic projectile launchers. 5,182,254, Cl. 505-1.000.

Oyama, Hajime: *See*—
Hasegawa, Shin; Oyama, Hajime; Katoh, Eiichi; and Moriya, Masao, 5,182,600, Cl. 355-246.000.

Oyama, Tetsuo: *See*—
Gotoh, Yoshitaka; Kikuchi, Shigeru; Nakazawa, Tetsuo; Miyoshi, Tadahiko; Oyama, Tetsuo; Ozawa, Yoshihiro; and Itoh, Shinichi, 5,182,075, Cl. 376-150.000.

Oyevaar, Martin H.: *See*—
Maria van Hout, Hendricus H.; Oyevaar, Martin H.; and Held, Bert J., 5,182,361, Cl. 528-371.000.

Ozaki, Masahide; Uji, Masanori; Yamazaki, Makoto; and Ito, Tatsuo, to Yoshida Kogyo K.K. Process for the manufacture of slide fasteners. 5,181,305, Cl. 29-408.000.

Ozaki, Tadashi: *See*—
Nishida, Minoru; Mizuno, Naohito; Ohtsuka, Yoshinori; Ozaki, Tadashi; and Uesugi, Hiroshi, 5,181,417, Cl. 73-115.000.

Ozawa, Koichi; Abe, Hajime; and Owashi, Yutaka, to Toshiba Machine Co., Ltd. Heating and cooling unit. 5,182,117, Cl. 425-144.000.

Ozawa, Kunitaka: *See*—
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Mizusawa, Nobutoshi; Suda, Shigeyuki; Nose, Noriyuki; and Kariya, Takao, 5,182,615, Cl. 356-400.000.

Ozawa, Masayuki: *See*—
Izawa, Katsuyoshi; Kobayashi, Ryoichi; and Ozawa, Masayuki, 5,182,628, Cl. 257-707.000.

Ozawa, Yoshihiro: *See*—
Gotoh, Yoshitaka; Kikuchi, Shigeru; Nakazawa, Tetsuo; Miyoshi, Tadahiko; Oyama, Tetsuo; Ozawa, Yoshihiro; and Itoh, Shinichi, 5,182,075, Cl. 376-150.000.

Ozeki, Yuji: *See*—
Okada, Tadao; Ikeno, Hajime; Ozeki, Yuji; Higaki, Yoshikazu; Matsubara, Koshi; and Nakamura, Kenichi, 5,182,349, Cl. 526-265.000.

Ozkaynak, Engin: *See*—
Oppermann, Hermann; Kuberasampath, Thangavel; Rueger, David C.; and Ozkaynak, Engin, 5,182,365, Cl. 530-326.000.

Ozone, Osamu: *See*—
Sato, Toshihiro; Kiyama, Masaaki; Harita, Yasuhiro; and Ozone, Osamu, 5,181,838, Cl. 417-360.000.

Pacific Biotech, Inc.: *See*—
Fan, Eugene; Chen, Fon-Chiu M.; Milner, Michael W.; and Rehg, Leslie J., 5,182,191, Cl. 435-7.900.

Pacific Chemical Co., Ltd.: *See*—
Kim, Young D.; and Ha, Byung J., 5,182,373, Cl. 536-4.100.

Paige, Lowell E.: *See*—
Cavanaugh, Wayne B.; Paige, Lowell E.; and Ripka, Chester D., 5,181,390, Cl. 62-126.000.

Paige Manufacturing Company Incorporated: *See*—
Dickie, Robert G.; and Phillips, Michael, 5,182,032, Cl. 249-91.000.

Palfreyman, Michael G.; Bey, Philippe; and McDonald, Ian A., to Merrell Dow Pharmaceuticals Inc. Inhibitors of lysyl oxidase. 5,182,297, Cl. 514-438.000.

Paliwoda, Joseph; Casadonte, Robert B.; and Reinke, Ronald R., to Deco-Grand, Inc. Thru-feed lapping apparatus. 5,181,346, Cl. 51-327.000.

Palmaer, Eric K.: *See*—
Palmaer, Karl V.; and Palmaer, Eric K., 5,181,601, Cl. 198-831.000.

Palmaer, Karl V.; and Palmaer, Eric K. Plastic conveyor belt with integral sideplate. 5,181,601, Cl. 198-831.000.

Palmer, Ramon L., Jr.: *See*—
Layton, Mark R.; Palmer, Ramon L., Jr.; and Smith, Lester L., 5,181,851, Cl. 434-226.000.

Pan, Ampere, to Primax Electronics Ltd. Handheld image scanner with automatic movement control. 5,182,450, Cl. 250-234.000.

Pan, Robert Y.: *See*—
Morrall, Stephen W.; Gosselink, Eugene P.; Pan, Robert Y.; and Nayar, Bala C., 5,182,043, Cl. 252-174.000.

Pancotti, Santino, to Agusta S.p.A. Helicopter blade. 5,181,829, Cl. 416-134.00A.

Paneccasio, Vincent, Jr.: *See*—
Haydu, Juan; Paneccasio, Vincent, Jr.; and Cacciatore, Patricia A., 5,182,006, Cl. 205-213.000.

Panin, Fabio, to Agence Spatiale Europeenne. Fine adjustment control mechanism for orientation and/or positioning of a pay load. 5,181,430, Cl. 74-99.00R.

Pape, Peter H. K.; and Tuschy, Jorg O. P., to Minnesota Mining and Manufacturing Company. Composite laminate adhesive tape coiled in an endless roll form and process for forming the laminate adhesive tape roll. 5,182,156, Cl. 428-130.000.

Papermasters, Inc.: *See*—
Volkert, John K., 5,181,901, Cl. 493-331.000.

Paquet, Jean-Marc: *See*—
Baret, Gilles; Chicherie, Jean-Pierre; and Paquet, Jean-Marc, 5,181,414, Cl. 73-40.700.

Pares-Corominas, Juan: *See*—
Cuberes-Altisent, Maria R.; Frigola-Constansa, Jordi; and Pares-Corominas, Juan, 5,182,280, Cl. 514-252.000.
Frigola-Constansa, Jordi; and Pares-Corominas, Juan, 5,182,281, Cl. 514-252.000.

Paris Manufacturing Co., Inc.: *See*—
Gilbert, Stephen F., 5,181,333, Cl. 38-15.000.

Parker, Theodore L., to Dow Chemical Company, The. Curing polyester or polycarbonate and polyepoxide with polyorgano phosphorous catalyst. 5,182,344, Cl. 525-438.000.

Pascoe, James R.: *See*—
Kuhlmann, Erven J.; Pascoe, James R.; Browne, James E.; and Martin, Kevin J., 5,182,247, Cl. 502-217.000.

Passaglia, Dick: *See*—
Linden, Tom H.; Passaglia, Dick; and Taccolini, Ray, 5,181,623, Cl. 211-183.000.

Passantino, Nancy L.: *See*—
Gross, Anthony E.; and Passantino, Nancy L., 5,181,957, Cl. 75-772.000.

Pasternak, Mordechai; and Reale, John, Jr., to Texaco Inc. Dewatering of concentrated aqueous solutions by pervaporation. 5,182,022, Cl. 210-638.000.

Patch, Teresa: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Patoiseau, Jean-Francois: *See*—
Duflos, Alain; Patoiseau, Jean-Francois; Bigg, Dennis; and Kiss, Robert, 5,182,273, Cl. 514-83.000.

Patsch, Manfred: *See*—
Siegel, Bernd; and Patsch, Manfred, 5,182,371, Cl. 534-612.000.

Pattano, Pietro, to Fiat Auto S.P.A. Automatically regulated belt stretching device. 5,181,887, Cl. 474-101.000.

Patterson, Jimmy L.; and Riley, Robert E., to BASF Corporation. Blowing agent-containing polymeric MDI compositions. 5,182,311, Cl. 521-131.000.

Patterson, Jon M.: *See*—
Hutchison, Wayne R.; Patterson, Jon M.; Hardesty, Terry D.; Teal, Richard D.; Hayes, Eugene G.; Coffey, Michael J.; and Moore, Earl T., 5,181,688, Cl. 248-680.000.

Pattock, Greg R., to Sparton Corporation. Shift lever interlock system. 5,181,592, Cl. 192-4.00A.

Patton, Richard A.; and Richardson, Walter A., to Morton International, Inc. Sodium borohydride composition and improved method of producing compacted sodium borohydride. 5,182,046, Cl. 252-188.260.

Patz, Ulrich: *See*—
Maasa, Wolfram; and Patz, Ulrich, 5,182,003, Cl. 204-298.230.

Pauker, Robert: *See*—
Viebach, Thomas; Kreibich, Rainer; Nuber, Bernd; Pauker, Robert; and Hesse, Alexander, 5,181,512, Cl. 128-660.030.

Paul, Thomas R.: *See*—
Creasman, Edwin A.; Paul, Thomas R.; Weber, Kenneth E.; Navarrete, David R.; McCullough, Jimmy D.; and Soodjinda, Churchai T., 5,182,053, Cl. 264-1.400.

Paynting, Richard J., to Bose Corporation. Multiple zone audio system. 5,182,552, Cl. 340-825.250.

PCC Airfoils, Inc.: *See*—
Blazek, William S.; and Wheaton, Harold L., 5,181,550, Cl. 164-100.000.

Peaches, Christine: *See*—
Arzoumanidis, Gregory G.; and Peaches, Christine, 5,182,245, Cl. 502-115.000.

Pedersen, Steven K.: *See*—
Cote, Pierre L.; Maurion, Roger P.; Lipski, Christopher J.; and Pedersen, Steven K., 5,182,019, Cl. 210-321.800.

Peleg, Eliezer; Bolin, Michael J.; Browder, George A. G., Jr.; and Price, Charles M., to Sara Lee Corporation. Method of forming briefs. 5,181,278, Cl. 2-243.00R.

Pellegata, Renato L., to Roussel Uclaf. Furosemide salts. 5,182,300, Cl. 514-471.000.

Pelletier, Luc: *See*—
Ferguson, James; and Pelletier, Luc, 5,182,566, Cl. 342-357.000.

Pellow, Terence R.; and Midgley, Ronald A., to Rolls-Royce plc. Gas turbine engine shroud ring mounting. 5,181,827, Cl. 415-173.300.

Peng, Mike. Combination note and article support device and method. 5,181,742, Cl. 281-45.000.

Perino, Andrea, to Olivetti-Canon Industriale S.p.A. Sheet feeding device having the ability to back a sheet into the sheet supply tray. 5,181,712, Cl. 271-109.000.

Perkitny, Jerzy, to Those Characters From Cleveland. Apparatus for simulating a licking motion. 5,181,877, Cl. 446-337.000.

Perram, David L.: *See*—
Crittenden, John C.; Notthakun, Sawang; Hand, David W.; and Perram, David L., 5,182,030, Cl. 210-748.000.

Perratone, Rene : *See*—
Poldervaart, Leendert; and Perratone, Rene , 5,181,748, Cl. 285-24.000.

Perrella, Guido: *See*—
Bagnoli, Carlo; Perrella, Guido; and Majo, Tommaso, 5,182,808, Cl. 395-725.000.

Perry, Patrick E.: *See*—
Erdelyi, Charles K.; Marshall, Mark G.; Mathews, John W.; and Perry, Patrick E., 5,182,468, Cl. 307-296.100.

Pesak, Milan: *See*—
Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , 5,182,285, Cl. 514-255.000.

Peschmann, Kristian R.; and Harmann, Jonathan, to Invision Technologies, Inc. Automatic concealed object detection system having a pre-scan stage. 5,182,764, Cl. 378-57.000.

Pesheck, Peter S.; and Lentz, Ronald R., to Pillsbury Company, The. Thick metal microwave susceptor. 5,182,425, Cl. 219-10.55E.

Peters, Jorg: *See*—
Hubricht, Gerhard; Schunk, Bernd; Stollewerk, Reinfried; and Peters, Jorg, 5,181,673, Cl. 244-3.120.

Peters, Judith A. Facial vaporizing device. 5,181,510, Cl. 128-368.000.

Petersen, Erwin: *See*—
Bartscher, Peter; Singbartl, Gunther; Petersen, Erwin; and Ulrich, Helmut, 5,181,418, Cl. 73-146.300.

Petersen, Flemming O.: *See*—
Lindgren, Claes; Moller, Brent; Petersen, Flemming O.; and Vigenberg, Stig F., 5,181,340, Cl. 49-371.000.

Petersen, Philip R.; Robbins, III: Frederick P.; and Winston, William G., to Exxon Chemical Patents Inc. Naphthenic acid corrosion inhibitors. 5,182,013, Cl. 208-348.000.

Peterson, Karen B.: *See*—
Hallinan, E. Ann; Husa, Robert K.; and Peterson, Karen B., 5,182,272, Cl. 514-80.000.

Peterson, Oscar J.: *See*—
Gneiding, Donald R.; and Peterson, Oscar J., 5,181,977, Cl. 152-429.000.

Petit, Jean-Michel; and Devallez, Alain, to GEC Alsthom SA. Rail vehicle bogey with independent motorized wheels. 5,181,473, Cl. 105-133.000.

Petit, Robert, to Lir France (S.A.). Device for closing flasks. 5,181,624, Cl. 215-330.000.

Petroleo Brasileiro S.A. - Petrobras: *See*—
Goncalves, Carlos Alberto D. C., 5,182,792, Cl. 392-468.000.

Petrozello, James R.: *See*—
Van Brunt, Karl B., Jr.; and Petrozello, James R., 5,181,853, Cl. 439-67.000.

Pettigrew, Dennis K. Workpiece holddown device. 5,181,702, Cl. 269-93.000.

Pettijohn, Ted. M., to Phillips Petroleum Company. Transition metal/-rare earth catalyst and olefin polymerization process. 5,182,244, Cl. 502-110.000.

Pettit, Paul H., Jr.; Singer, Debra L.; and Kaufman, Marvin L., to PPG Industries, Inc. Powder coating composition comprising a co-reactable particulate mixture of carboxylic acid group-containing polymers and beta-hydroxyalkylamide curing agent. 5,182,337, Cl. 525-176.000.

Peuckert, Marcellus: *See*—
Vaahs, Tilo; Peuckert, Marcellus; and Bruck, Martin, 5,182,411, Cl. 556-409.000.

Pfeiffer, James F.: *See*—
Mueller, Richard L.; Farley, Brian E.; and Pfeiffer, James F., 5,181,920, Cl. 606-159.000.

Pfiester, James R., to Motorola, Inc. Semiconductor device having an MOS transistor with overlapped and elevated source and drain. 5,182,619, Cl. 257-382.000.

Pfizer Hospital Products Group, Inc.: *See*—
Dumbleton, John H.; Lin, Ruey Y.; Stark, Casper F.; and Crippen, Thomas E., 5,181,930, Cl. 623-23.000.

Pfizer Inc.: *See—*
Mylari, Banavara L.; and Zembrowski, William J., 5,182,391, Cl. 544-236.000.
Pharmacia Deltec, Inc.: *See—*
Scanlon, David A., 5,181,910, Cl. 604-67.000.
Phelan, John R.: *See—*
Pollack, Richard S.; Phelan, John R.; Ames, Ronald M.; Starkey, Gene R.; Brown, Robert W.; Belski, Gary T.; and Dunn, William F., 5,181,975, Cl. 152-152.100.
Phelps, Michael J.: *See—*
Liang, Bob C.-C.; Liang, Nina Y.; Phelps, Michael J.; and Tannenbaum, David C., 5,182,797, Cl. 395-160.000.
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, to Roussel Ulcaf. Intermediates for 3-keto-19-nor-$\Delta^{4,9}$ steroids. 5,182,381, Cl. 540-4.000.
Philipps, Michael; Schad, Hans-Dieter; and Viel, Wolfgang, to Hottinger Baldwin Messtechnik GmbH. Apparatus for sensing and transmitting in a wireless manner a value to be measured. 5,181,423, Cl. 73-724.000.
Phillips, Michael: *See—*
Dickie, Robert G.; and Phillips, Michael, 5,182,032, Cl. 249-91.000.
Phillips Petroleum Company: *See—*
Pettijohn, Ted. M., 5,182,244, Cl. 502-110.000.
Stricklen, Phil M.; Hasenberg, Daniel M.; and Rooney, Patrick, 5,182,330, Cl. 525-247.000.
Phillips, Van L. Foot prosthesis having auxiliary ankle construction. 5,181,932, Cl. 623-52.000.
Phillips, Van L. Split foot prosthesis. 5,181,933, Cl. 623-55.000.
Photocompilation PMS, Inc.: *See—*
Ferguson, James; and Pelletier, Luc, 5,182,566, Cl. 342-357.000.
Piaget, Gary D. Apparatus and methods employing elastic cords with hand balls. 5,181,726, Cl. 273-414.000.
Pialet, Joseph W.; Scharf, Curtis R.; and DiBiase, Stephen A., to Lubrizol Corporation, The. Phosphorus- and/or nitrogen-containing derivatives of sulfur-containing compounds, lubricant, fuel and functional fluid compositions. 5,182,037, Cl. 252-47.500.
Picheny, Michael A.: *See—*
Bahl, Lalit R.; Picheny, Michael A.; Nahamoo, David; and de Souza, Peter V., 5,182,773, Cl. 381-41.000.
Pichowkin, Oleg. Reversible fish finder apparatus. 5,182,732, Cl. 367-173.000.
Picozza, Augusto A.: *See—*
Daenen, Robert H. C. M.; Lillelund, Stig; Kato, Masao; Lonergan, Peter; and Picozza, Augusto A., 5,181,626, Cl. 220-282.000.
Piehl, James R.: *See—*
Braun, Robert D.; Crass, Matthew M.; Piehl, James R.; Schend, David J.; Wollert, Gary S.; Mueckl, Jerry W.; and Becker, Thomas P., 5,182,512, Cl. 324-175.000.
Pier, Timothy J.: *See—*
Anthon, Douglas W.; Clark, John H.; Johnson, Leo; and Pier, Timothy J., 5,182,759, Cl. 372-72.000.
Pierre Fabre Medicament: *See—*
Duflos, Alain; Patoiseau, Jean-Francois; Bigg, Dennis; and Kiss, Robert, 5,182,273, Cl. 514-83.000.
Pierret, Jean-Marie; and Michel, Didier, to Valeo Equipements Electriques Moteur. Detector circuit for detecting a phase signal of a polyphase alternator for a battery charge regulator in a motor vehicle, and utilization thereof. 5,182,511, Cl. 324-158.0MG.
Piet Hein A/S: *See—*
Hein, Piet, 5,181,324, Cl. 33-270.000.
Pike, William C., to Dow Chemical Company, The. Resins having improved exchange kinetics. 5,182,026, Cl. 210-688.000.
Pikulin, Michael A.: *See—*
White, David E.; Pikulin, Michael A.; Gandek, Thomas P.; and Friend, William H., 5,181,989, Cl. 162-241.000.
Pillsbury Company, The: *See—*
Pesheck, Peter S.; and Lentz, Ronald R., 5,182,425, Cl. 219-10.55E.
Schmidt, William G.; Lockwood, Dean H.; and Carter, Jeffrey D., 5,182,125, Cl. 426-68.000.
Pinsky, Naum: *See—*
Clough, Thomas J.; Grosvenor, Victor L.; and Pinsky, Naum, 5,182,165, Cl. 428-263.000.
Pioneer Electric Corporation: *See—*
Hatanaka, Yuuji; Okamoto, Hiroo; Arai, Takao; Wakumura, Shinichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 5,182,678, Cl. 360-32.000.
Pioneer Electronic Corporation: *See—*
Chikuma, Kiyofumi; and Takei, Kiyoshi, 5,182,669, Cl. 359-241.000.
Piotrowski, Stanley; and Levine, Ronald I., to Ontario Die Company Limited. Method for producing structural injection molded parts using lost motion movement between a mold and surrounding cutting blade. 5,182,065, Cl. 264-153.000.
Piotrowski, Tadeusz W., to Cincinnati Milacron, Inc. Adjustable alignment assembly and method. 5,181,304, Cl. 29-271.000.
Piotrowski, Tadeusz W., to Cincinnati Milacron, Inc. Cover assembly for multi-configurable machine tool. 5,181,898, Cl. 483-3.000.
Pirelli Cable Corporation: *See—*
Marin, Carlo, 5,182,066, Cl. 264-169.000.
Pirelli Trasmissioni Industriali S.p.A.: *See—*
Robecchi, Edoardo, 5,181,890, Cl. 474-237.000.
Pirl, William E.; Smith, Edward H.; Roth, Charles H., Jr.; Lutz, Rodney A.; and Anderson, John J., to Westinghouse Electric Corp. System and method for laser welding the inner surface of a tube. 5,182,429, Cl. 219-121.630.
Pitlak, Robert T.: *See—*
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.
Pitney Bowes Inc.: *See—*
Francisco, Robert, 5,182,798, Cl. 395-200.000.
Weimer, Charles M., 5,182,700, Cl. 361-400.000.
Pitzele, Lennart D.: *See—*
Boylan, Jeffrey J.; and Pitzele, Lennart D., 5,182,536, Cl. 336-65.000.
Plaehn, Jay L. Tub-shower header-bar accessory-rack w/universal-bracket. 5,181,621, Cl. 211-181.000.
Plaisner, Vaclav: *See—*
Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , 5,182,285, Cl. 514-255.000.
Plant, Rex B.; and Marton, John P., to 461844 Ontario Limited. Apparatus for producing a vegetable product. 5,181,458, Cl. 99-538.000.
Plasma Energy Corporation: *See—*
Camacho, Salvador L., 5,182,073, Cl. 266-52.000.
Platt, Stuart M. Ladder-like stilts for ceiling work. 5,181,583, Cl. 182-129.000.
Plester, George, to Coca-Cola Co., The. Portable automatic water carbonator. 5,182,084, Cl. 422-105.000.
Pliant Plastics Corporation: *See—*
Bishop, Thomas R.; Thom, Richard A.; and Breveglieri, Frank L., 5,181,605, Cl. 206-37.100.
Plishka, Martin J.: *See—*
Duranleau, Roger G.; Plishka, Martin J.; and Cuscurida, Michael, 5,182,025, Cl. 210-681.000.
Plost, Gerald N.; and Hodgson, Henry A. Drain plug absence indicator. 5,182,556, Cl. 340-984.000.
Podd, Stephen D.: *See—*
Podd, Victor T., Sr.; Podd, Victor I., Jr.; and Podd, Stephen D., 5,181,625, Cl. 220-1.500.
Podd, Victor I., Jr.: *See—*
Podd, Victor T., Sr.; Podd, Victor I., Jr.; and Podd, Stephen D., 5,181,625, Cl. 220-1.500.
Podd, Victor T., Sr.; Podd, Victor I., Jr.; and Podd, Stephen D. Liner for a cargo container. 5,181,625, Cl. 220-1.500.
Podewils, Herbert A.: *See—*
Stich, Frederick A.; Baxter, Richard V., Jr.; Podewils, Herbert A.; and Layden, David L., 5,182,518, Cl. 324-511.000.
Pogue, Glenn J., to Rotex, Inc. Apparatus for clearing the weigh pan of a particle size analyzer. 5,181,618, Cl. 209-239.000.
Pohl, Peter; and Gruber, Reinhold, to Webasto AG Fahrzeugtechnik. Drive device for an adjustable part of a vehicle. 5,181,891, Cl. 475-162.000.
Polan, Ned W.: *See—*
Brock, Andrew J.; Lin, Lifun; Menkin, Paul; and Polan, Ned W., 5,181,770, Cl. 205-77.000.
Poldervaart, Leendert; and Perratone, Rene , to Single Buoy Moorings Inc. Quick-acting coupling and quick-acting coupling assembly. 5,181,748, Cl. 285-24.000.
Polidoro, Gilbert J. Portable bench-type electric ignite for gas welding torches. 5,182,436, Cl. 219-262.000.
Pollack, Michael J. Probe for transmitting light through a fluid. 5,182,791, Cl. 385-147.000.
Pollack, Richard S.; Phelan, John R.; Ames, Ronald M.; Starkey, Gene R.; Brown, Robert W.; Belski, Gary T.; and Dunn, William F., to Goodyear Tire & Rubber Company, The. Integrated circuit transponder with coil antenna in a pneumatic tire for use in tire identification. 5,181,975, Cl. 152-152.100.
Pollnow, Russell: *See—*
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.
Polyplastics Co., Ltd.: *See—*
Kanaka, Keiichi; and Hijikata, Kenji, 5,182,359, Cl. 528-193.000.
Ponce de Leon, Lorenzo A.: *See—*
Stamps, Douglass K., Jr.; Ponce de Leon, Lorenzo A.; and King, Jeffrey S., 5,182,568, Cl. 343-702.000.
Poole, Samuel E., Jr. Molded connector. 5,181,508, Cl. 128-203.120.
Poorter, Tiemen: *See—*
Behagel, Frank P.; Poorter, Tiemen; and Nuijten, Petrus A. C. M., 5,182,479, Cl. 307-571.000.
Pope, Kevin J.: *See—*
Heyes, Peter J.; Leishman, Ian M.; and Pope, Kevin J., 5,181,409, Cl. 72-46.000.
Portas, Abelardo A.; and O de Portas, Graciela I. Compound applicable as carrier for substances or active chemical, physical or biological products. 5,182,096, Cl. 424-45.000.
Porter, Neil: *See—*
Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, 5,182,207, Cl. 435-253.500.
Porter, Philip: *See—*
Clayton, Richard A.; and Porter, Philip, 5,182,216, Cl. 436-518.000.

Pospisil, Arnost: *See—*
Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , 5,182,285, Cl. 514-255.000.

Pote, Thomas: *See—*
Pote, William; Johansen, Roger; and Pote, Thomas, 5,181,316, Cl. 29-828.000.

Pote, William; Johansen, Roger; and Pote, Thomas, to Flexco Microwave, Inc. Method for making flexible coaxial cable. 5,181,316, Cl. 29-828.000.

Pourtau, Jean-Jacques; and Pourtau, Thierry E., to Tomecanic. Profiled, strip particularly adapted to compensate the relative displacements of a floor covering with respect to an adjacent wall and process for manufacturing such a profiled strip. 5,181,357, Cl. 52-179.000.

Pourtau, Thierry E.: *See—*
Pourtau, Jean-Jacques; and Pourtau, Thierry E., 5,181,357, Cl. 52-179.000.

Powell, Charles S., to Norfolk Southern Railway Co. Loadwidth gauge for railway cars. 5,181,327, Cl. 33-833.000.

Power, Scott D.: *See—*
Estell, David A.; Bott, Richard R.; Power, Scott D.; and Wells, James A., 5,182,204, Cl. 435-222.000.

Powers, Kenneth W.; Wang, Hsien-Chang; Handy, Debra C.; and Fusco, James V., to Exxon Chemical Patents Inc. Production of rubbery isoolefin polymers. 5,182,333, Cl. 525-315.000.

Powers, Kenneth W.: *See—*
Fusco, James V.; Wang, Hsien-Chang; and Powers, Kenneth W., 5,182,350, Cl. 526-308.000.

Powers, Maston L., to Conoco Inc. Outlet collectors that are rate insensitive. 5,181,537, Cl. 137-561.00A.

PPG Industries, Inc.: *See—*
Kapp, David C.; Boston, Russell E.; Carlblom, Leland H.; McKinley, Mildred L.; and Kozma, Jess A., 5,182,148, Cl. 428-34.600.
Koontz, Harry S.; and Forr, John P., 5,182,431, Cl. 219-203.000.
Martz, Jonathan T.; Schimmel, Karl F.; Sundararaman, Padmanabhan; and Walters, David N., 5,182,355, Cl. 528-75.000.
Pettit, Paul H., Jr.; Singer, Debra L.; and Kaufman, Marvin L., 5,182,337, Cl. 525-176.000.

Prager, Bernhard C.; Wessely, Karl; and Veit, Werner, to Biochemie Gesellschaft m.b.H. Stable, crystalline form of a cephalosporin intermediate product. 5,182,383, Cl. 540-225.000.

Prats, Christian; and Vivier, Pierre, to Ceramiques Techniques Desmarquest. Femoral prosthesis employing a small ceramic ball. 5,181,929, Cl. 623-23.000.

Praxair S.T. Technology, Inc.: *See—*
Finicle, Robert L., 5,182,149, Cl. 428-34.600.

Presidenza del Consiglio dei Ministri - Ufficio del Ministro per il coordinamento delle Inizitivae per la Ricerco Scientifica e Technologica: *See—*
Lepori, Agostino; and Camaion, Domenico, 5,181,958, Cl. 106-170.000.

Preussag Aktiengesellschaft: *See—*
Hoelscher, Hans-Juergen; Kerk, Thomas; Tuennermann, Wilfried; and Winnacker, Helmut, 5,182,731, Cl. 367-84.000.

Price, Charles M.: *See—*
Peleg, Eliezer; Bolin, Michael J.; Browder, George A. G., Jr.; and Price, Charles M., 5,181,278, Cl. 2-243.00R.

Price, Michael I.: *See—*
Smith, R. Paul; and Price, Michael I., 5,181,803, Cl. 405-129.000.

Prignon, Gary: *See—*
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Primax Electronics Ltd.: *See—*
Pan, Ampere, 5,182,450, Cl. 250-234.000.

Prince Corporation: *See—*
Arbisi, Thomas E.; Dykstra, Ronald A.; and Stannis, Gordon J., 5,182,675, Cl. 359-841.000.

PRN Services, Inc.: *See—*
Erlich, Frederick, 5,181,913, Cl. 604-263.000.

Procter & Gamble Company, The: *See—*
McNally, Mark P., 5,181,630, Cl. 222-109.000.
Morrall, Stephen W.; Gosselink, Eugene P.; Pan, Robert Y.; and Nayar, Bala C., 5,182,043, Cl. 252-174.000.

Promech Sorting Systems B.V.: *See—*
Geerts, Jan C., 5,181,597, Cl. 198-365.000.

ProTechnics International, Inc.: *See—*
Bandy, Thomas R.; Read, Donna A.; and Wallace, Edward S., 5,182,051, Cl. 252-645.000.

Prottengeier, Edgar: *See—*
Siegner, Helge; and Prottengeier, Edgar, 5,181,589, Cl. 188-374.000.

Pugia, Michael J.: *See—*
Genshaw, Marvin A.; and Pugia, Michael J., 5,182,213, Cl. 436-66.000.

Pulpdent Corporation: *See—*
Stanwich, Lawrence J.; Berk, Kenneth J.; Berk, Fredrick M.; and Berk, Donald A., 5,181,755, Cl. 294-1.100.

Puma Rudolf Dassler Sport: *See—*
Berger, Christoph, 5,181,331, Cl. 36-50.100.

Puritan-Bennett Corporation: *See—*
Hui, Henry K.; Divers, George A., III; and Soikowski, Carmen, 5,182,353, Cl. 528-31.000.

Quality Air Systems, Inc.: *See—*
Hofstra, Joseph S.; Karaskiewicz, Ronald J.; and Fischer, Mark R., 5,181,883, Cl. 454-49.000.

Quantum Chemical Corporation: *See—*
Murib, Jawad H.; and Damle, Pradeep D., 5,182,058, Cl. 264-54.000.

Quaranta, Joseph: *See—*
Hannah, Marcia G.; Mehrer, George W.; Noone, Michael J.; Stahl, Kermit E.; and Quaranta, Joseph, 5,181,361, Cl. 52-535.000.

Quick, James R.; and Gordon, Robert L., to International Paper Company. Flexible container with nonstick interior. 5,181,610, Cl. 206-447.000.

Quintana, Julio M.: *See—*
Mueller, Mark D.; Jones, Frank L.; Quintana, Julio M.; Ruddy, Kenneth E.; and Mims, Michael G., 5,181,571, Cl. 166-381.000.

Quipp Systems, Inc.: *See—*
Sjogren, Christer A.; and Cote, Kevin, 5,181,820, Cl. 414-331.000.

Radtke, Manfred, to Eastman Kodak Company. Stapling unit having an auxiliary device for attaching an anvil. 5,181,309, Cl. 29-465.000.

Radtke, Manfred, to Eastman Kodak Company. Sheet-stapling device. 5,181,643, Cl. 227-110.000.

Raehse, Wilfried: *See—*
Bauer, Volker; Raehse, Wilfried; Koester, Klaus; and Jacobs, Jochen, 5,182,054, Cl. 264-15.000.

Raemdonck, Joris V.: *See—*
Bezin, Michel; and Raemdonck, Joris V., 5,181,732, Cl. 280-279.000.

Raemdonck, Marcel A.: *See—*
Degrauwe, Dirk M.; Raemdonck, Marcel A.; and Geleyns, Eduard A., 5,181,963, Cl. 118-325.000.

Raith, Krister A.: *See—*
Dahlin, Jan E. A. S.; and Raith, Krister A., 5,182,753, Cl. 371-43.000.

Ramsteiner, Falko: *See—*
Horn, Peter; Heckmann, Walter; Ramsteiner, Falko; and Gerold, Friedrich, 5,182,354, Cl. 528-60.000.

Rano, Thomas A.: *See—*
DiNinno, Frank; Rano, Thomas A.; and Greenlee, Mark L., 5,182,384, Cl. 540-302.000.

Rao, Ashok D., to Fluor Corporation. Process and system for producing power. 5,181,376, Cl. 60-39.050.

Raphael, Deirdre R.: *See—*
Raphael, Jacques E.; and Raphael, Deirdre R., 5,181,284, Cl. 4-572.100.

Raphael, Jacques E.; and Raphael, Deirdre R. Infant bathtub. 5,181,284, Cl. 4-572.100.

Rau, Willy; Rau, Wolfgang; and Taus, Christian, to Maschinenfabrik Rau GmbH, Firma. Equipment system for agricultural ground soil preparation. 5,181,476, Cl. 111-60.000.

Rau, Wolfgang: *See—*
Rau, Willy; Rau, Wolfgang; and Taus, Christian, 5,181,476, Cl. 111-60.000.

Ravet, Georges: *See—*
Bousquet, Hubert; Ravet, Georges; and Rousset, Jacky, 5,181,662, Cl. 241-16.000.

Ray, Paul E. Arrow guide apparatus. 5,181,502, Cl. 124-44.500.

Raychem Corporation: *See—*
Jones, Philip J., 5,182,663, Cl. 359-70.000.

Raytheon Company: *See—*
Sklenak, John B.; and Maiellano, Joseph C., Jr., 5,182,426, Cl. 219-10.55F.

RCA Thomson Licensing Corporation: *See—*
Haferl, Peter E., 5,182,504, Cl. 315-370.000.

Read, Donna A.: *See—*
Bandy, Thomas R.; Read, Donna A.; and Wallace, Edward S., 5,182,051, Cl. 252-645.000.

Read, Stanley E.: *See—*
Hall, William W.; Read, Stanley E.; Lyons, Michael; and Zabriskie, John B., 5,182,306, Cl. 514-629.000.

Reale, John, Jr.: *See—*
Pasternak, Mordechai; and Reale, John, Jr., 5,182,022, Cl. 210-638.000.

Recovermat Technologies, Inc.: *See—*
Smith, R. Paul; and Price, Michael I., 5,181,803, Cl. 405-129.000.

Reents, Terry R., to Wagner Spray Tech Corporation. Fan motor and air hose storage housing for portable spray paint guns. 5,181,832, Cl. 417-234.000.

Regelsberger, Matthias H.: *See—*
Lee, J. Kelly; Reznik, Svetlana; and Regelsberger, Matthias H., 5,182,062, Cl. 264-129.000.

Reh, Carter K.: *See—*
Robak, Edward; and Reh, Carter K., 5,181,771, Cl. 312-7.200.

Rehg, Leslie J.: *See—*
Fan, Eugene; Chen, Fon-Chiu M.; Milner, Michael W.; and Rehg, Leslie J., 5,182,191, Cl. 435-7.900.

Reichelt, Helmut: *See—*
Derber, Bernd; Hansen, Guenter; Reichelt, Helmut; Vamvakaris, Christos; and Zeidler, Georg, 5,182,372, Cl. 534-857.000.

Reichhart, Robert: *See—*
Zeppezauer, Michael; and Reichhart, Robert, 5,182,257, Cl. 514-2.000.

Reinelt, Werner: *See—*
Geuns, Guy; and Reinelt, Werner, 5,181,451, Cl. 91-170.0MP.

Reinert, Gerhard; and Fuso, Francesco, to Ciba-Geigy Corporation. Thermal and photochemical stabilization of dyeings on polyamide fibers:sterically hindered phenol and ultra-violet absorber. 5,181,935, Cl. 8-442.000.

Reinke, Ronald R.: *See—*
Paliwoda, Joseph; Casadonte, Robert B.; and Reinke, Ronald R., 5,181,346, Cl. 51-327.000.

Research Development Corporation of Japan: *See—*
Goto, Eiichi; Geng, Qiquan; and Yuyama, Junpei, 5,181,383, Cl. 62-6.000.
Nishikubo, Tadaomi, 5,182,320, Cl. 524-88.000.

Resnick, Paul R.: *See—*
Feiring, Andrew E.; Krespan, Carl G.; Resnick, Paul R.; Smart, Bruce E.; Treat, Theodore A.; and Wheland, Robert C., 5,182,342, Cl. 526-206.000.

Retartha, Anthony: *See—*
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Reuben, Jayakumar: *See—*
Monthony, James F.; Livingston, Dwight; Reuben, Jayakumar; and Tite, Robert C., 5,182,082, Cl. 422-57.000.

Reum, Donald J., to Avon Plastics, Inc. Garden hose and couplings. 5,181,750, Cl. 285-38.000.

Revab B.V.: *See—*
Beumer, Anton H., 5,181,762, Cl. 297-358.000.

Reynolds, Gordon S.: *See—*
Reynolds, Valdon G.; Sorenson, James L.; and Reynolds, Gordon S., 5,181,916, Cl. 606-16.000.

Reynolds, Valdon G.; Sorenson, James L.; and Reynolds, Gordon S., to Sorenson Laboratories, Inc. Surgical probe and smoke eliminator. 5,181,916, Cl. 606-16.000.

Reznik, Svetlana: *See—*
Lee, J. Kelly; Reznik, Svetlana; and Regelsberger, Matthias H., 5,182,062, Cl. 264-129.000.

Rheinmetall GmbH: *See—*
Hubricht, Gerhard; Schunk, Bernd; Stollewerk, Reinfried; and Peters, Jorg, 5,181,673, Cl. 244-3.120.

Rheme, Charles. Method of measurement of an angle of incidence of a luminous beam, measuring device for carrying out the method and use of the device for the measurement of distances. 5,182,612, Cl. 356-351.000.

Rheon Automatic Machinery Co., Ltd.: *See—*
Kageyama, Minoru; and Torikata, Yasuo, 5,182,124, Cl. 426-19.000.

Rhone-Poulenc Viscosuisse SA: *See—*
Hagmann, Karl, 5,182,457, Cl. 250-572.000.

Ricchio, Samuel G.: *See—*
Barker, Stephen F.; Ricchio, Samuel G.; Benton, Glenn A.; and Jackson, Delbert D., 5,182,083, Cl. 422-63.000.

Rice, Joseph A., Jr., to Texas Instruments Incorporated. Automatic compensator for an airborne magnetic anomaly detector. 5,182,514, Cl. 324-244.000.

Rich, William L.: *See—*
Abraham, Robert L.; Moore, Richard E.; Rich, William L.; Shackelford, Floyd W.; Tiller, John R., Jr.; and Briggs, Richard S., Jr., 5,182,804, Cl. 395-600.000.

Richardson, John, to Imperial Chemical Industries PLC. High speed spinning process. 5,182,068, Cl. 264-210.800.

Richardson, Walter A.: *See—*
Patton, Richard A.; and Richardson, Walter A., 5,182,046, Cl. 252-188.260.

Richter, Jan: *See—*
Allison, Joseph W.; Richter, Jan; Childers, Craig M.; Smalley, Dennis R.; Hull, Charles W.; and Jacobs, Paul F., 5,182,055, Cl. 264-22.000.

Ricoh Co. Ltd.: *See—*
Ejiri, Koichi, 5,182,708, Cl. 364-419.000.
Hasegawa, Shin; Oyama, Hajime; Katoh, Eiichi; and Moriya, Masao, 5,182,600, Cl. 355-246.000.
Hodoshima, Takashi; and Katoh, Shunji, 5,182,601, Cl. 355-270.000.
Kikuchi, Shuichi; and Itoh, Masami, 5,182,673, Cl. 359-691.000.
Nakayama, Hiroshi; Kojima, Keiji; and Sato, Gen, 5,182,777, Cl. 382-18.000.

Ricoh Corporation: *See—*
Ejiri, Koichi, 5,182,708, Cl. 364-419.000.

Rigbi, Meir; and Jackson, Craig M., to Bio-Technology General Corp. Factor Xa inibitor from leech and pharmaceutical compositions containing same. 5,182,113, Cl. 424-537.000.

Riley, Glen M.: *See—*
Hurlbut, Amy O.; Riley, Glen M.; and Sinks, Rod G., 5,182,746, Cl. 370-100.100.

Riley, Kenneth L.: *See—*
Cody, Ian A.; Dumfries, David H.; Neal, Arthur H.; and Riley, Kenneth L., 5,182,248, Cl. 502-230.000.

Riley, Richard: *See—*
Nonnenmacher, Ronald C.; Schulz, Kathleen; Lewis, Richard C.; and Riley, Richard, 5,181,313, Cl. 29-620.000.

Riley, Robert E.: *See—*
Patterson, Jimmy L.; and Riley, Robert E., 5,182,311, Cl. 521-131.000.

Ripka, Chester D.: *See—*
Cavanaugh, Wayne B.; Paige, Lowell E.; and Ripka, Chester D., 5,181,390, Cl. 62-126.000.

Ritts, Gary, to CSD, Inc. Magnetically levitated spinning axel display apparatus. 5,182,533, Cl. 335-306.000.

Riverwood International Corporation: *See—*
Lashyro, Jeffrey A.; and Bitner, Robert J., 5,181,598, Cl. 198-377.000.

Roads Corporation: *See—*
Wilson, James B. S.; Serle, Peter M.; and Siroky, Zdenek, 5,181,794, Cl. 404-6.000.

Robak, Edward; and Reh, Carter K., to Sony Trans Com Inc. Triple spring torque motor. 5,181,771, Cl. 312-7.200.

Robbins, III: Frederick P.: *See—*
Petersen, Philip R.; Robbins, III: Frederick P.; and Winston, William G., 5,182,013, Cl. 208-348.000.

Robecchi, Edoardo, to Pirelli Trasmissioni Industriali S.p.A. Elastic driving belt and process for identifying and detecting residual elastic elongations in said belt stretched between two pulleys. 5,181,890, Cl. 474-237.000.

Robert Bosch GmbH: *See—*
Fieldler, Gerhard; and Conzelmann, Gerhard, 5,182,531, Cl. 333-167.000.
Wolff, Guenter, 5,181,768, Cl. 303-84.200.

Roberts, David. Kit and two-step cosmetic treatment for hair. 5,181,529, Cl. 132-209.000.

Roberts, Elaine E.: *See—*
Roberts, Kenneth G.; and Roberts, Elaine E., 5,182,616, Cl. 356-402.000.

Roberts, Kenneth G.; and Roberts, Elaine E., to K. G. Roberts & Associates. Color communication kits. 5,182,616, Cl. 356-402.000.

Robertshaw Controls Company: *See—*
Buckshaw, Thomas M.; Erdelsky, Joseph J.; and Martin, David M., 5,182,539, Cl. 337-310.000.

Robertson, Mark A., to EEV Limited. Rising sun magentron with planar tuning member protruding into only one set of cavities. 5,182,493, Cl. 315-39.610.

Robertson, Stuart C., to GPT Limited. Optical backplane interconnecting circuit boards. 5,182,780, Cl. 385-14.000.

Robison, Richard G.: *See—*
Martin, James E.; and Robison, Richard G., 5,181,424, Cl. 73-835.000.

Roblin, William J., to Dorn Color, Inc. Sample collator device with samples gathered on pins. 5,181,704, Cl. 270-54.000.

Robson, Anthony E.: *See—*
Manheimer, Wallace M.; Robson, Anthony E.; and Meger, Robert A., 5,182,496, Cl. 315-111.410.

Rock, Peter J., to General Electric Company. Attenuating shroud support. 5,181,826, Cl. 415-173.100.

Rockefeller University, The: *See—*
Hall, William W.; Read, Stanley E.; Lyons, Michael; and Zabriskie, John B., 5,182,306, Cl. 514-629.000.
Tam, James P., 5,182,261, Cl. 514-12.000.

Rockwell International Corporation: *See—*
Culp, Gordon W., 5,182,484, Cl. 310-328.000.

Rodabaugh, Timothy E. Split oil pan construction. 5,181,487, Cl. 123-195.00C.

Rodi, Anton; Hauck, Dieter; May, Karl-Heinz; and Muller, Hans, to Heidelberger Druckmaschinen AG. System for inputting and/or outputting signals of a digital control system for a printing machine including a digital filter. 5,182,803, Cl. 395-575.000.

Rodondi, Andrew F.; Cope, Kenneth P.; Gladd, Joseph H.; and Savich, James R., to General Motors Corporation. Electrical sleeve terminal. 5,181,867, Cl. 439-854.000.

Roe, Bob J., to ITT Corporation. Radome structure providing high ballistic protection with low signal loss. 5,182,155, Cl. 428-116.000.

Roemmele, Carl F.; and Meister, Donald F., to Target Products, Inc. Abrasive cleaning apparatus. 5,181,348, Cl. 51-410.000.

Rogers Corporation: *See—*
Swei, Gwo, 5,182,173, Cl. 428-391.000.

Rogozinski, Chaim. System and method for instrumentation of the spine in the treatment of spinal deformities. 5,181,917, Cl. 606-61.000.

Rohde, Jurgen: *See—*
Chakraborty, Amiya K.; Rohde, Jurgen; Klatt, Karl-Heinz; Wenzl, Helmut; and Konrad, Ralf, 5,181,845, Cl. 431-7.000.

Rohm Co., Ltd.: *See—*
Tanaka, Osamu, 5,182,660, Cl. 359-49.000.

Rohm and Haas Company: *See—*
Arkens, Charles T., 5,182,179, Cl. 429-254.000.
Biale, John, 5,182,327, Cl. 524-556.000.

Roisin, Jean P.: *See—*
Esvan, Daniel; and Roisin, Jean P., 5,181,415, Cl. 73-54.280.

Rolfe, Richard: *See—*
Lovecky, Craig; and Rolfe, Richard, 5,182,692, Cl. 360-132.000.

Rolls-Royce plc: *See—*
Pellow, Terence R.; and Midgley, Ronald A., 5,181,827, Cl. 415-173.300.

Rontey, Daniel C.; Bigando, Donald; and Wolfeil, Frank, to Ireco, Inc. Precision delay detonator. 5,182,417, Cl. 102-204.000.

Rooney, Patrick: *See—*
Stricklen, Phil M.; Hasenberg, Daniel M.; and Rooney, Patrick, 5,182,330, Cl. 525-247.000.

Rose, James W.: *See—*
Cole, Herbert S., Jr.; Rose, James W.; Guida, Renato; and Liu, Yung S., 5,182,188, Cl. 430-323.000.

Ross, Dale T. Cushioned helmet. 5,181,279, Cl. 2-413.000.

Rossnagel, Stephen M.: *See*—
Donelon, John J.; Doyle, James P.; Hurst, Jerry E., Jr.; Oprysko, Modest M.; Rossnagel, Stephen M.; and von Gutfeld, Robert J., 5,182,230, Cl. 437-173.000.

Rotex, Inc.: *See*—
Pogue, Glenn J., 5,181,618, Cl. 209-239.000.

Roth, Charles H., Jr.: *See*—
Pirl, William E.; Smith, Edward H.; Roth, Charles H., Jr.; Lutz, Rodney A.; and Anderson, John J., 5,182,429, Cl. 219-121.630.

Rothenberger, Danny: *See*—
McKown, Kenneth W.; and Rothenberger, Danny, 5,181,568, Cl. 166-293.000.

Rothenberger, Roland D.: *See*—
Nowak, Matthew M.; Rothenberger, Roland D.; and Vinson, Mark A., 5,182,629, Cl. 257-577.000.

Round, Mary Jo: *See*—
Barr, Robin; Beauchesne, Linda; Benson, Ronald; Burdick, Maureen; Duffy, Joan; Fletcher, Paul; Fritz, Denise; Gaddas, John R.; Girardini, Joseph; Guilmette, Robert; Hughes, David; Long, Joseph; Maytubby, Lymon; Montresor, Beverly; Moore, Susan; Patch, Teresa; Pollnow, Russell; Prignon, Gary; Retartha, Anthony; Round, Mary Jo; and Machnich, Christopher, 5,182,705, Cl. 364-401.000.

Roussel Uclaf: *See*—
Benoit, Marc; Brayer, Jean-Louis; Demoute, Jean-Pierre; Mouriroux, Gilles; and Taliani, Laurent, 5,182,295, Cl. 514-365.000.
Clemence, Francois; Guillaume, Jacques; and Hamon, Gilles, 5,182,282, Cl. 514-253.000.
Pellegata, Renato L., 5,182,300, Cl. 514-471.000.
Smets, Pierre; and Zalisz, Rene, 5,182,378, Cl. 536-4.100.

Roussel Ulcaf: *See*—
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 5,182,381, Cl. 540-4.000.

Rousset, Jacky: *See*—
Bousquet, Hubert; Ravet, Georges; and Rousset, Jacky, 5,181,662, Cl. 241-16.000.

Rowe, David M.: *See*—
Clay, Burton R.; and Rowe, David M., 5,182,659, Cl. 359-17.000.

Rowland, Richard R.; Fong, Ronald A.; Wiersema, Richard J.; and Zielske, Alfred G., to Clorox Company, The. Late peracid precursors. 5,182,045, Cl. 252-186.380.

Rowlette, John R., Sr.: *See*—
Joyce, James L., Jr.; Jones, Warren C.; Rowlette, John R., Sr.; MacInnes, David F., Jr.; and Vyas, Navin N., 5,182,050, Cl. 252-500.000.

Royal Postgraduate Medical School: *See*—
Wertheim, David F. P.; Oozeer, Rowena C.; Dubowitz, Victor; Connell, John A.; and Brydon, John W. E., 5,181,520, Cl. 128-731.000.

Rubbermaid Commercial Products Inc.: *See*—
Andrews, Howard W., Jr.; Kowalski, John A.; and Wahl, Friedrich G., 5,181,297, Cl. 24-336.000.

Ruben, Paul L.: *See*—
Betensky, Ellis I.; and Ruben, Paul L., 5,182,592, Cl. 354-221.000.

Ruch, Mark H., to Compaq Computer Corporation. Method and apparatus for selecting a single sheet of paper from a paper tray. 5,181,708, Cl. 271-21.000.

Rudak, Peter; and Hadgis, George A., to Eastman Kodak Company. Dot-matrix video enhancement for optical character recognition. 5,182,778, Cl. 382-54.000.

Ruddy, Kenneth E.: *See*—
Mueller, Mark D.; Jones, Frank L.; Quintana, Julio M.; Ruddy, Kenneth E.; and Mims, Michael G., 5,181,571, Cl. 166-381.000.

Rueffer, Manfred: *See*—
Schiel, Lothar; von Gruenberg, Hubertus; Wagner, Wilfried; Rueffer, Manfred; and Jung, Christoph, 5,181,769, Cl. 303-114.300.

Rueger, David C.: *See*—
Oppermann, Hermann; Kuberasampath, Thangavel; Rueger, David C.; and Ozkaynak, Engin, 5,182,365, Cl. 530-326.000.

Ruff, Klaus; Falk, Bernhard; and Liesching, Detlef, to Huls Troisdorf Aktiengesellschaft. Method for processing residues from the distillation of chlorosilanes. 5,182,095, Cl. 423-659.000.

Ruiz-Leal, Leopoldo I.: *See*—
Berrun-Castanon, Jorge D.; Guerra-Reyes, Maria T.; and Ruiz-Leal, Leopoldo I., 5,181,954, Cl. 75-433.000.

Rumer, Klaus, to Diehl GmbH & Co. Impact member with multiple concentric gas cushions inflated in sequence. 5,181,697, Cl. 267-116.000.

Rumph, George W.: *See*—
Anstey, Henry D.; Ardueser, William A.; and Rumph, George W., 5,181,368, Cl. 53-587.000.

Runyan, Max R., to McDonnell Douglas Corporation. Method and tooling for fabricating monolithic metal or metal matrix composite structures. 5,181,647, Cl. 228-44.300.

Rusch, Volker: *See*—
Zeppezauer, Michael; and Reichhart, Robert, 5,182,257, Cl. 514-2.000.

Russell, Gary S., to ISP Investments Inc. Water dispersible pressure sensitive hot melts. 5,182,323, Cl. 524-322.000.

Ruzic, Ivan. Rotary engine. 5,181,490, Cl. 123-243.000.

Ryba, Anton, to Mair-Egg, Harald. Automatically coupling fan for automative cooling systems. 5,181,483, Cl. 123-41.120.

Rydelek, James G.: *See*—
Kroll, Arthur S.; Dunn, Arthur E.; DeCecca, Michael L.; Gaudino, David M.; Livadas, Jerry E.; Fairport, David R.; and Rydelek, James G., 5,182,608, Cl. 355-326.000.

Ryeson Corporation: *See*—
Livingston, Troy W., 5,181,425, Cl. 73-862.080.

Ryobi Motor Products Corp.: *See*—
McCracken, Robert E., 5,181,813, Cl. 409-182.000.

Saari, Risto V. J., to A. Ahlstrom Corporation. Method of freezing and separation. 5,181,396, Cl. 62-541.000.

Saburi, Toshiki; Fujimoto, Masaya; Tsuruta, Tadashi; and Nunogaki, Naochika, to Nippondenso Co., Ltd. Gas component detecting element and detector. 5,182,136, Cl. 427-126.300.

Sadayori, Toshio: *See*—
Komatsubara, Michiro; Kurosawa, Mitsumasa; Hayakawa, Yasuyuki; Iida, Yoshiaki; and Sadayori, Toshio, 5,181,972, Cl. 148-111.000.

Saeki, Mitsuru: *See*—
Saho, Norihide; Nemoto, Takeo; and Saeki, Mitsuru, 5,181,385, Cl. 62-51.100.

Sagami Chemical Research Center: *See*—
Fuchikami, Takamasa; Ubukata, Yumiko; and Tanaka, Yasutaka, 5,182,246, Cl. 502-161.000.

Sagawa, Seiji; Kano, Toshio; Yachigo, Shinichi; and Ida, Kanako, to Kyodo Chemical Company Limited; and Sumitomo Chemical Company, Limited. Isocyanuric acid derivative useful as a light stabilizer. 5,182,390, Cl. 544-222.000.

Sage, Ian C.: *See*—
Coates, David; Sage, Ian C.; and Greenfield, Simon, 5,182,047, Cl. 252-299.660.

Sager, Paul, to Fischer, Andrew. Bicycle generator mounting bracket. 5,181,684, Cl. 248-231.600.

Sagstetter, William E.: *See*—
Wanderer, Alan A.; and Sagstetter, William E., 5,181,524, Cl. 128-764.000.

Saho, Norihide; Nemoto, Takeo; and Saeki, Mitsuru, to Hitachi, Ltd. Cryostat and nuclear magnetic resonance imaging apparatus including a cryostat. 5,181,385, Cl. 62-51.100.

Saia AG: *See*—
Sieber, Edmond, 5,181,429, Cl. 74-89.150.

Saillot, Patrick W. R.: *See*—
Lardellier, Alain, M. J.; and Saillot, Patrick W. R., 5,181,675, Cl. 244-54.000.

St. Clair, Joe C.: *See*—
Kaiser, John M.; and St. Clair, Joe C., 5,182,554, Cl. 340-826.000.

Saito, Asao: *See*—
Ishinaga, Hiroyuki; Saito, Asao; and Mori, Toshihiro, 5,182,577, Cl. 346-140.00R.

Saito, Keiichi: *See*—
Yamamoto, Toshihiro; Kimura, Masao; and Saito, Keiichi, 5,182,352, Cl. 526-329.200.

Saito, Yoshinori: *See*—
Nakashima, Hisaharu; Hayasaki, Hiroyuki; Suzuki, Masami; Saito, Yoshinori; and Matuyama, Hisasi, 5,182,635, Cl. 358-12.000.

Saito, Yutaka: *See*—
Kizu, Sojiro; Saito, Yutaka; Ninomiya, Ichiro; and Sasho, Hidehiko, 5,182,677, Cl. 360-14.200.

Sakaegi, Yuji: *See*—
Shinbori, Kenichi; Maeda, Nasaya; and Sakaegi, Yuji, 5,182,546, Cl. 340-636.000.

Sakaguchi, Nobuo: *See*—
Bauer, Steven R.; Kudo, Akira; Melchers, Georg F.; and Sakaguchi, Nobuo, 5,182,205, Cl. 435-240.200.

Sakai, Kikuo, to Shinwa Denshi Kabushiki Kaisha. Adhesive tape cutting device. 5,181,983, Cl. 156-523.000.

Sakai, Kunihiro: *See*—
Yanagisawa, Yoshihiro; Sakai, Kunihiro; Takamatsu, Osamu; Eguchi, Ken; Matsuda, Hiroshi; Kawade, Hisaaki; and Takeda, Toshihiko, 5,182,724, Cl. 365-151.000.

Sakai, Yasunosuke: *See*—
Noda, Touru; Tsubaki, Masayuki; Sakai, Yasunosuke; Ashida, Tetsuya; and Matsuda, Hiroshi, 5,182,161, Cl. 428-195.000.

Sakai, Yoshihiko: *See*—
Miyake, Hiroyuki; Abe, Tsutomu; Ito, Hisao; Hotta, Hiroyuki; Shimizu, Yasumoto; and Sakai, Yoshihiko, 5,182,625, Cl. 257-443.000.

Sakai, Yoshio: *See*—
Suzuki, Masato; Inaba, Hiromi; Takenaga, Hiroshi; Yamazaki, Masachika; Oonuma, Naoto; Nakamura, Kiyoshi; Sakai, Yoshio; Yoneda, Kenji; Nakata, Naofumi; and Kasai, Syoji, 5,182,776, Cl. 382-14.000.

Sakai, Yukio: *See*—
Mochida, Isao; Sakai, Yukio; and Ohtsuka, Hiroyuki, 5,182,010, Cl. 208-44.000.

Sakaki, Mamoru; Nakatsugawa, Tomomi; and Sato, Hiroshi, to Canon Kabushiki Kaisha. Recording medium. 5,182,175, Cl. 428-537.500.

Sakamaki, Hisashi: *See*—
Masuda, Shunichi; Shimizu, Katsuichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 5,182,597, Cl. 355-205.000.

Sakamoto, Hiroki; Matsuyama, Hidenobu; and Shibata, Kimihiro, to Nissan Motor Co., Ltd. Method of laser quenching. 5,182,433, Cl. 219-121.850.

Sakamoto, Katsuhiko: *See*—
Kan, Toshiya; and Sakamoto, Katsuhiko, 5,181,484, Cl. 123-90.170.

Sakamoto, Satoshi, to Sony Corporation. Voice coil type actuator. 5,182,481, Cl. 310-13.000.

Sakamoto, Shunichiro: *See*—
Hatanaka, Yuuji; Okamoto, Hiroo; Arai, Takao; Wakumura, Shinichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 5,182,678, Cl. 360-32.000.

Sakamura, Ken, to Mitsubishi Denki Kabushiki Kaisha. Exception, interrupt, and trap handling apparatus which fetches addressing and context data using a single instruction following an interrupt. 5,182,811, Cl. 395-800.000.

Sakata, Kazunari; Ishii, Katsumi; and Yamaga, Kenichi, to Tokyo Electron Sagami Limited. Apparatus for processing semiconductors. 5,181,819, Cl. 414-217.000.

Sakata, Shigekazu; Ito, Yasuo; Ochiai, Kunio; and Yamagata, Hisao, to Kokusai Denshin Denwa Co., Ltd. Protocol conversion system. 5,182,748, Cl. 370-94.100.

Sako, Hiroyuki: *See*—
Hiramatsu, Akinori; Okamoto, Futoshi; Kido, Hiroshi; Sako, Hiroyuki; Yamanaka, Yukio; and Yamada, Koji, 5,182,702, Cl. 363-132.000.

Sakurai, Yoshihiro, to Sanshin Kogyo Kabushiki Kaisha. Two different fuel feeder. 5,181,488, Cl. 123-179.110.

Sakuraya, Hideo: *See*—
Nagasawa, Tsugio; Shuto, Tadashi; Matsumoto, Toshiaki; Sakuraya, Hideo; and Nishimoto, Shoji, 5,182,252, Cl. 503-227.000.

Salk Institute for Biological Studies, The: *See*—
Ling, Nicholas C. K.; Ueno, Naoto; Shimasaki, Shunichi; Esch, Frederick S.; Ying, Shao-Yao; and Guillemin, Roger C. L., 5,182,375, Cl. 536-23.500.

Salmon, John K.: *See*—
Yoo, Young S.; and Salmon, John K., 5,181,586, Cl. 187-1.00A.

Salzmann, Thomas N.: *See*—
Dininno, Frank P.; and Salzmann, Thomas N., 5,182,385, Cl. 540-302.000.

Sampson, Stephen A.: *See*—
Dambach, Philip J.; Long, Jerry A.; and Sampson, Stephen A., 5,181,852, Cl. 439-52.000.

Samsung Electronics Co., Ltd.: *See*—
Chang, Ui Y., 5,181,846, Cl. 431-80.000.
Kim, Jong-Woo, 5,182,573, Cl. 346-1.100.
Soon-Ho, Park, 5,182,506, Cl. 318-568.100.

Sanada, Takashi: *See*—
Abe, Hiroomi; Nagaoka, Kenji; Nishio, Taichi; Shinonaga, Hideo; and Sanada, Takashi, 5,182,336, Cl. 525-132.000.

Sandair Nevada, Inc.: *See*—
Schaffer, Stephen C., 5,181,349, Cl. 51-410.000.

Sanden Corporation: *See*—
Miyazawa, Tadashi, 5,181,882, Cl. 453-63.000.

Sanders, Clifton G.: *See*—
Winters, Suzanne; Solen, Kenneth A.; Sanders, Clifton G.; Mortensen, J. D.; and Berry, Gaylord, 5,182,317, Cl. 523-112.000.

Sanders, Glenn. Method and apparatus for obtaining identical output signals from time base corrector unit having variable or different electrical characteristics using a video tape of known parameters. 5,182,654, Cl. 358-320.000.

Sandhu, Gurtej S.: *See*—
Chhabra, Navjot; and Sandhu, Gurtej S., 5,182,232, Cl. 437-200.000.

Sandoz Ltd.: *See*—
Houlihan, William J., 5,182,271, Cl. 514-77.000.

Sands, Stephen: *See*—
Haralampu, Stephen G.; Sands, Stephen; and Gross, Akiva, 5,182,130, Cl. 427-3.000.

Sandvik, Lars V., to General Engineering (Netherlands) B.V. Vehicle seat arrangement. 5,181,758, Cl. 296-68.100.

Sano, Homare: *See*—
Takei, Hajime; Yamakoshi, Yukiyoshi; Matsuda, Naoyuki; Moro, Fuminori; Tomita, Hiroshi; and Sano, Homare, 5,181,707, Cl. 271-20.000.

Sano, Shyuzo: *See*—
Hongo, Mikio; Mizukoshi, Katsuro; Sano, Shyuzo; Kamimura, Takashi; and Takahashi, Takahiko, 5,182,231, Cl. 437-173.000.

Sano, Teruo: *See*—
Sato, Takashi; and Sano, Teruo, 5,182,657, Cl. 358-465.000.

Sano, Yoshio, to NEC Corporation. Plasma display having increased brightness. 5,182,489, Cl. 313-485.000.

Sano, Yumiko: *See*—
Takaoka, Kazuhito; Uehara, Masatoshi; and Sano, Yumiko, 5,182,182, Cl. 430-124.000.

Sanofi: *See*—
Gubin, Jean; Chatelain, Pierre; Descamps, Marcel; Nisato, Dino; Inion, Henri; Lucchetti, Jean; Mahaux, Jean-Marie; and Vallat, Jean-Noel, 5,182,291, Cl. 514-300.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Arai, Hideto; and Kobayashi, Seiji, 5,181,870, Cl. 440-77.000.
Hiraoka, Noriyoshi; and Suzuki, Toyoshi, 5,181,871, Cl. 440-77.000.
Nakamura, Kazuhiro, 5,182,510, Cl. 322-21.000.
Sakurai, Yoshihiro, 5,181,488, Cl. 123-179.110.

Santa Barbara Research Center: *See*—
Norton, Paul R., 5,182,217, Cl. 437-5.000.

Santen Pharmaceutical Co., Ltd.: *See*—
Shirasaki, Yasufumi; and Ashida, Shinichiro, 5,182,276, Cl. 514-224.200.

Santi, Daniel V.: *See*—
Huebner, Verena D.; and Santi, Daniel V., 5,182,366, Cl. 530-334.000.

Santilli, Joseph. Combination nail bag and open top container. 5,181,637, Cl. 224-196.000.

Sanyo Chemical Industries, Ltd.: *See*—
Umaki, Yasuhide; Tomita, Rokuro; Hondo, Fumiaki; and Okada, Shigeru, 5,181,961, Cl. 106-724.000.

Sanyo Electric Co., Ltd.: *See*—
Nakashima, Hisaharu; Hayasaki, Hiroyuki; Suzuki, Masami; Saito, Yoshinori; and Matuyama, Hisasi, 5,182,635, Cl. 358-12.000.
Nomura, Hiroshi, 5,182,478, Cl. 307-521.000.

Sara Lee Corporation: *See*—
Peleg, Eliezer; Bolin, Michael J.; Browder, George A. G., Jr.; and Price, Charles M., 5,181,278, Cl. 2-243.00R.

Sara Lee/DE N.V.: *See*—
van Hattem, Jan C.; and Sperna Weiland, Jan A. E., 5,181,753, Cl. 285-205.000.

Sareshwala, Sohel A.: *See*—
Benson, Robert W.; Beiley, Mark J.; Sareshwala, Sohel A.; Croft, Steven T.; and Vaughn, Jack M., 5,181,752, Cl. 285-81.000.

Sargeant, Steven J.: *See*—
Bagchi, Pranab; and Sargeant, Steven J., 5,182,189, Cl. 430-449.000.

Sasaki, Kimito: *See*—
Iwai, Noriyuki; Sasaki, Kimito; Yano, Masaru; Wakimoto, Fumiyoshi; Tokunaga, Wataru; and Shirakura, Masaru, 5,182,676, Cl. 359-841.000.

Sasaki, Tadao, to Sony Corporation. Integrated converter with gate for supplying integrating dock pulses to counters only during reference signal integrating period. 5,182,561, Cl. 341-166.000.

Sashida, Nobuo: *See*—
Yamamoto, Yuushin; Sashida, Nobuo; Yamasaki, Yuuko; and Kawabata, Takao, 5,182,463, Cl. 307-46.000.

Sasho, Hidehiko: *See*—
Kizu, Sojiro; Saito, Yutaka; Ninomiya, Ichiro; and Sasho, Hidehiko, 5,182,677, Cl. 360-14.200.

Sato, Akira: *See*—
Taguchi, Kazuo; Onisawa, Kenichi; Fuyama, Moriaki; Tamura, Katsumi; Abe, Yoshio; Nakayama, Takahiro; Hashimoto, Kenichi; and Sato, Akira, 5,182,491, Cl. 313-503.000.

Sato, Gen: *See*—
Nakayama, Hiroshi; Kojima, Keiji; and Sato, Gen, 5,182,777, Cl. 382-18.000.

Sato, Haruo: *See*—
Nagai, Shigeki; Sato, Haruo; and Karube, Nagahisa, 5,181,959, Cl. 106-211.000.

Sato, Hiroaki: *See*—
Yoshioka, Osami; Matsui, Naoki; Sato, Hiroaki; Omori, Kouji; Yamazaki, Masayuki; Suzuki, Masafumi; Oishi, Hitoshi; Kitagawa, Naoto; Seike, Takaya; and Araki, Yasuhiro, 5,182,074, Cl. 266-87.000.

Sato, Hiroshi: *See*—
Sakaki, Mamoru; Nakatsugawa, Tomomi; and Sato, Hiroshi, 5,182,175, Cl. 428-537.500.

Sato, Hisakazu: *See*—
Tamura, Toshiyuki; Fujita, Masaki; Komori, Shinji; Sato, Hisakazu; and Takata, Hidehiro, 5,182,799, Cl. 395-400.000.

Sato, Junichi, to Sony Corporation. Method of filling a recess flat with a material by a bias ECR-CVD process. 5,182,221, Cl. 437-67.000.

Sato, Katsutoshi: *See*—
Matsutani, Kanji; Fukuda, Masatoshi; and Sato, Katsutoshi, 5,181,645, Cl. 227-177.000.

Sato, Kenichi: *See*—
Yamaguchi, Kentoku; and Sato, Kenichi, 5,182,769, Cl. 379-387.000.

Sato, Masamitsu; and Tanishima, Masami, to Nihon Kohden Corporation. Internal pressure measuring device using catheter with multiple lumens. 5,181,516, Cl. 128-673.000.

Sato, Nobuo: *See*—
Tomimuro, Hisashi; Ishitsuka, Fuminori; Sato, Nobuo; and Osaki, Takaaki, 5,182,631, Cl. 257-664.000.

Sato, Norman J., to H. B. Fuller Licensing & Financing Inc. Radio frequency cure of thermoset-receptor compositions. 5,182,134, Cl. 427-543.000.

Sato, Tadahisa: *See*—
Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, 5,182,339, Cl. 525-242.000.

Sato, Tadayuki: *See*—
Hibino, Sadayoshi; Sato, Tadayuki; and Mochizuki, Motoyasu, 5,182,483, Cl. 310-211.000.

Sato, Takashi; and Sano, Teruo, to Casio Computer Co., Ltd. Image processing apparatus including binary data producing unit. 5,182,657, Cl. 358-465.000.

Sato, Toshihiro; Kiyama, Masaaki; Harita, Yasuhiro; and Ozone, Osamu, to Asmo Co., Ltd. Vehicle washer pump. 5,181,838, Cl. 417-360.000.

Satoh, Hisao: *See*—
Fukuchi, Masakazu; Morita, Shizuo; Haneda, Satoshi; Satoh, Hisao; and Ikeda, Tadayoshi, 5,182,595, Cl. 355-200.000.

Satoh, Jun-ichi: *See*—
Koga, Keiji; Satoh, Jun-ichi; Yokoyama, Kenji; Nisizawa, Akinori; and Tokuoka, Yasumichi, 5,182,693, Cl. 360-135.000.

Satou, Kouichi: *See*—
Uehara, Shinichi; Satou, Kouichi; and Baba, Seigo, 5,182,122, Cl. 425-526.000.

Satou, Tetsuhito: *See*—
Ono, Kiyoshi; Kishimoto, Yoshio; and Satou, Tetsuhito, 5,182,133, Cl. 427-516.000.

Sausner, Andreas; and Spies, Karl H., to Carl Freudenberg, Firma. Shaft-rotated throttle disk. 5,181,492, Cl. 123-337.000.

Savegh, Emile G.; Martinez, John E.; and Cedrone, Alfredo, to W. L. Gore & Associates, Inc. High-flex optical fiber coil cable. 5,182,785, Cl. 385-128.000.

Savenije, Hermannus B.: *See*—
Claesen, Christianus A.; Lohmeijer, Johannus H. G. M.; Boogers, Michael P. J.; Bussink, Jan; Savenije, Hermannus B.; Hoeks, Theodorus L.; and Gosens, Johannes C., 5,182,325, Cl. 524-404.000.

Savich, James R.: *See*—
Rodondi, Andrew F.; Cope, Kenneth P.; Gladd, Joseph H.; and Savich, James R., 5,181,867, Cl. 439-854.000.

Savin, Ronald R. Coating composition containing metal-coated microspheres exhibiting improved resistance to environmental attack of metallic substrates. 5,182,318, Cl. 523-216.000.

Sawyer, David B.: *See*—
Bishop, Jerry B.; Schwind, Francis A.; and Sawyer, David B., 5,181,844, Cl. 418-152.000.

Scanlon, David A., to Pharmacia Deltec, Inc. Method and apparatus for a fluid infusion system with linearized flow rate change. 5,181,910, Cl. 604-67.000.

Scaramucci, John P. Compact swing check valve. 5,181,535, Cl. 137-515.500.

Schad, Hans-Dieter: *See*—
Philipps, Michael; Schad, Hans-Dieter; and Viel, Wolfgang, 5,181,423, Cl. 73-724.000.

Schaeffer, Bernarr C. Lightweight sandwich panel. 5,182,158, Cl. 428-178.000.

Schaeffer GmbH: *See*—
Schwarz, Michael, 5,181,300, Cl. 24-585.000.

Schaffer, Stephen C., to Sandair Nevada, Inc. Self-powered unitary portable granular particle ejector tool. 5,181,349, Cl. 51-410.000.

Scharf, Curtis R.: *See*—
Pialet, Joseph W.; Scharf, Curtis R.; and DiBiase, Stephen A., 5,182,037, Cl. 252-47.500.

Schauder, Colin D., to Westinghouse Electric Corp. Reconfigurable AC induction motor drive for battery-powered vehicle. 5,182,508, Cl. 318-801.000.

Schea, Henry E., III; and Cleary, Kenneth M., Jr., to Amgen Inc. Freeze protective shipping units. 5,181,394, Cl. 62-371.000.

Schend, David J.: *See*—
Braun, Robert D.; Crass, Matthew M.; Piehl, James R.; Schend, David J.; Wollert, Gary S.; Mueckl, Jerry W.; and Becker, Thomas P., 5,182,512, Cl. 324-175.000.

Scherbatskoy, Serge A. Method and apparatus for transmitting information in a borehole employing signal discrimination. 5,182,730, Cl. 367-83.000.

Schering Corporation: *See*—
Ting, Pauline C.; Sherlock, Margaret H.; Tom, Wing C.; and Kaminski, James J., 5,182,289, Cl. 514-278.000.
Watkins, Robert W., 5,182,264, Cl. 514-16.000.

Scheuchzer, Antoine P., to Les Fils d'Auguste Scheuchzer S.A. Device for the substitution of the rails of railway tracks. 5,181,472, Cl. 104-2.000.

Schickaneder, Helmut: *See*—
Morsdorf, Peter; Engler, Heidrun; Schickaneder, Helmut; and Ahrens, Kurt-Henning, 5,182,294, Cl. 514-341.000.

Schiel, Lothar; von Gruenberg, Hubertus; Wagner, Wilfried; Rueffer, Manfred; and Jung, Christoph, to ITT Corporation. Automotive vehicle brake unit with anti-locking device. 5,181,769, Cl. 303-114.300.

Schierjott, Rudolf: *See*—
Goepel, Ernst; and Schierjott, Rudolf, 5,182,578, Cl. 346-140.00R.

Schilling, Peter: *See*—
LeBlanc, Paul J.; and Schilling, Peter, 5,182,326, Cl. 524-514.000.

Schimmel, Karl F.: *See*—
Martz, Jonathan T.; Schimmel, Karl F.; Sundararaman, Padmanabhan; and Walters, David N., 5,182,355, Cl. 528-75.000.

Schlaikjer, Carl R., to Battery Engineering, Inc. Primary cell having minimized drop in the start-up potential. 5,182,177, Cl. 429-48.000.

Schleimer, Bernhard: *See*—
Breuker, Walter; Wagner, Hans; Moller, Eckhard; and Schleimer, Bernhard, 5,181,987, Cl. 159-4.080.

Schlumberger Technology Corporation: *See*—
Thompson, Martin, 5,181,419, Cl. 73-153.000.

Schmedding, Diederik J. M.: *See*—
Kerkenaar, Antonius; Schmedding, Diederik J. M.; and Berg, Jan, 5,182,194, Cl. 435-130.000.

Schmid, Eckhardt: *See*—
Baumgarten, Peter; Egner-Walter, Bruno; Schmid, Eckhardt; and Scholl, Wolfgang, 5,181,293, Cl. 15-250.210.

Schmid, Friedrich; Joppig, Peter; and Klak, Roland, to Mercedes-Benz AG. Flame-type heater plug for an air-compression fuel-injection internal-combustion engine. 5,182,437, Cl. 219-270.000.

Schmidt, Bruce E.; and Swerts, Robert E. F., to Ecolab Inc. Antimicrobial lubricant composition containing a diamine acetate. 5,182,035, Cl. 252-34.000.

Schmidt, Ludwig: *See*—
Lonhoff, Norbert; Schmidt, Ludwig; Block, Hans-Dieter; and Weber, Rainer, 5,181,994, Cl. 204-97.000.

Schmidt, William G.; Lockwood, Dean H.; and Carter, Jeffrey D., to Pillsbury Company, The. The Product produced by process of freezing and ice glazing broccoli. 5,182,125, Cl. 426-68.000.

Schmitt, Gernot: *See*—
Merkel, Gerd; Vogt, Wilfried; Glaunsinger, Georg; Stadler, Peter; Zander, Claus-Peter; Maass, Jurgen; Schmitt, Gernot; Necker, Thomas; and Becker, Willi, 5,181,469, Cl. 101-415.100.

Schmitt, Wayne I.: *See*—
Carpenter, Lester E.; Schmitt, Wayne I.; Snell, Laurence; Bieber, David; Stucke, Donald W.; and Waltzer, Jeremy S., 5,181,590, Cl. 190-18.00A.

Schoch, Gregor, to Bobst SA. Device for assembling superposed, glued web-like layers. 5,181,330, Cl. 34-162.000.

Schofield, Ann C.: *See*—
Blinchikoff, Herman J.; and Schofield, Ann C., 5,182,563, Cl. 342-32.000.

Scholl, Wolfgang: *See*—
Baumgarten, Peter; Egner-Walter, Bruno; Schmid, Eckhardt; and Scholl, Wolfgang, 5,181,293, Cl. 15-250.210.

Schonafinger, Karl; and Ong, Helen H., to Hoechst-Roussel Pharmaceuticals Incorporated. Dihydro-4(hydroxyalkyeneamino)quinolines. 5,182,275, Cl. 514-222.800.

Schorey, Jeffrey S.: *See*—
Storrs, Stephen B.; and Schorey, Jeffrey S., 5,182,369, Cl. 530-647.000.

Schott Glaswerke: *See*—
Brix, Peter, 5,182,237, Cl. 501-66.000.

Schreck, John F.; and Truong, Phat C., to Texas Instruments Incorporated. Circuit and method for discharging a memory array. 5,182,726, Cl. 365-203.000.

Schreiber, David: *See*—
Johnson, Eric A.; Schreiber, David; Ho, Kwok P.; Hall, William T.; Yang, Huei-hsiung; and Geldiay-Tuncer, Beril, 5,182,208, Cl. 435-254.000.

Schrock, Alan K.: *See*—
Skorpenske, Richard G.; and Schrock, Alan K., 5,182,310, Cl. 521-116.000.

Schuch, Horst: *See*—
Voelker, Heinz; Alicke, Gerhard; Schuch, Horst; Weilbacher, Manfred; and Weber, Reinhold, 5,182,308, Cl. 521-79.000.

Schulz, Kathleen: *See*—
Nonnenmacher, Ronald C.; Schulz, Kathleen; Lewis, Richard C.; and Riley, Richard, 5,181,313, Cl. 29-620.000.

Schunk, Bernd: *See*—
Hubricht, Gerhard; Schunk, Bernd; Stollewerk, Reinfried; and Peters, Jorg, 5,181,673, Cl. 244-3.120.

Schwab, Edward C.; and Brown, George E., to General Mills, Inc. Microwave tempering of cooked cereal pellets or pieces. 5,182,127, Cl. 426-241.000.

Schwartz, Jae C.; Syka, John E. P.; and Louris, John N., to Finnigan Corporation. Method of operating an ion trap mass spectrometer in a high resolution mode. 5,182,451, Cl. 250-282.000.

Schwartz, Jimmy R. Communicative tools and fasteners. 5,181,439, Cl. 81-119.000.

Schwarz, Michael, to Schaeffer GmbH. Waistband fastener. 5,181,300, Cl. 24-585.000.

Schwarz, Waldemar: *See*—
Ertel, Gernot; Brabetz, Ludwig; and Schwarz, Waldemar, 5,182,523, Cl. 324-663.000.

Schwarzinger, Wolfgang: *See*—
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.

Schweizer, Harald. Apparatus for connecting a set of percussion instruments to a mixing desk. 5,182,416, Cl. 84-723.000.

Schwerdt, Gerald N. Water recirculating apparatus. 5,181,656, Cl. 237-8.00C.

Schwiegk, Stefan; Mathauer, Klemens; Wegner, Gerhard; Hoffmann, Bernd F. W.; and Vogel, Albrecht, to BASF Aktiengesellschaft. Reference electrode for chemical sensors. 5,182,005, Cl. 204-435.000.

Schwind, Francis A.: *See*—
Bishop, Jerry B.; Schwind, Francis A.; and Sawyer, David B., 5,181,844, Cl. 418-152.000.

Scientific Atlanta, Inc.: *See*—
Munich, Randy; Ewing, David; Lo, Tsai; Sheldrick, Wayne; and Chieh, Baldwin, 5,182,771, Cl. 380-5.000.

Scotti, Ronald E.: *See*—
Blonder, Greg E.; Cappuzzo, Mark A.; Clark, Harold R.; Scotti, Ronald E.; and Wong, Yiu-Huen, 5,182,787, Cl. 385-131.000.

Scripps Research Institute, The: *See*—
Dyer, Cheryl A.; Curtiss, Linda K.; and Smith, Richard, 5,182,364, Cl. 530-324.000.

Sea Shelf Engineering Pty Ltd.: *See*—
Apgar, William J., 5,181,674, Cl. 244-47.000.

Seagate Technology, Inc.: *See*—
Chapin, Robert E.; and Crane, Peter, 5,182,689, Cl. 360-103.000.
Krause, James N.; Tremaine, Brian P.; and Chan, Litko R., 5,182,685, Cl. 360-78.130.
Weispfenning, Gerald L.; and Goss, Lloyd C., 5,182,682, Cl. 360-77.080.

Sebag, Henri, to L'Oreal. Solubilizing and/or dispersant compounds, preparation process and compositions containing them. 5,182,407, Cl. 554-52.000.

Sechrist, Paul A.: *See*—
Lomas, David A.; Haun, Edward C.; and Sechrist, Paul A., 5,182,085, Cl. 422-144.000.

Seeger Industrial S.A.: *See*—
Becker, Karl L.; and Beldevere, Francesco, 5,181,454, Cl. 99-277.200.

Segaud, Daniel, to Valeo Vision. Multiplexed control devices for a set of electrical devices, e.g. in a motor vehicle. 5,182,494, Cl. 315-80.000.

Segill, Mark E.: *See*—
Segill, William; Segill, Mark E.; and Dangelo, Michael, 5,181,777, Cl. 362-405.000.
Segill, William; Segill, Mark E.; and Dangelo, Michael, to American Lighting Fixture Corp. Assembly system for a lighting fixture. 5,181,777, Cl. 362-405.000.
Seifert, Keith L.; and Furst, Robert E., to Torrington Company, The. Process for molding polymer bearing cage with amorphous case. 5,182,070, Cl. 264-241.000.
Seike, Takaya: *See*—
Yoshioka, Osami; Matsui, Naoki; Sato, Hiroaki; Omori, Kouji; Yamazaki, Masayuki; Suzuki, Masafumi; Oishi, Hitoshi; Kitagawa, Naoto; Seike, Takaya; and Araki, Yasuhiro, 5,182,074, Cl. 266-87.000.
Seiko Epson Corporation: *See*—
Hosomi, Hiroaki, 5,181,787, Cl. 400-120.000.
Mori, Katsumi; Asaka, Tatsuya; and Iwano, Hideaki, 5,182,757, Cl. 372-45.000.
Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hanssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, to Bayer Aktiengesellschaft. Pesticidal substituted 2-(6-(pyrimidinyl)-indol-1-yl)-acrylic esters. 5,182,286, Cl. 514-256.000.
Sekiguchi, Akira; Nakajima, Masao; Kurihara, Kazumasa; and Arai, Kenji, to Diesel Kiki Co., Ltd. Malfunction checking system for controller. 5,182,755, Cl. 371-16.300.
Sekii, Hiroshi; and Imanaka, Koichi, to Omron Corporation. Method of manufacturing a semiconductor light-emitting device. 5,182,228, Cl. 437-129.000.
Semborg Recrob, Corp.: *See*—
Lang, Victor H., 5,182,557, Cl. 341-20.000.
Semchena, John H.: *See*—
Lenzen, Reiner; Faigle, Ernst M.; and Semchena, John H., 5,181,737, Cl. 280-732.000.
Seno, Takao: *See*—
Yamamoto, Tadashi; Seno, Takao; and Shiota, Shuichiro, 5,182,002, Cl. 204-210.000.
Sente Creations Co., Ltd.: *See*—
Fukumura, Satoshi, 5,181,727, Cl. 273-450.000.
Serbio: *See*—
Esvan, Daniel; and Roisin, Jean P., 5,181,415, Cl. 73-54.280.
Serle, Peter M.: *See*—
Wilson, James B. S.; Serle, Peter M.; and Siroky, Zdenek, 5,181,794, Cl. 404-6.000.
Seyama, Kiyotaka: *See*—
Nishihara, Mikio; Murase, Teruo; Seyama, Kiyotaka; Kuwabara, Kiyoshi; and Ohshima, Osamu, 5,181,317, Cl. 29-401.100.
SGS-Thomson Microelectronics, Inc.: *See*—
Chen, Fusen E.; Dixit, Girish A.; and Miller, Robert O., 5,182,627, Cl. 257-49.000.
SGS-Thomson Microelectronics S.r.l.: *See*—
Gariboldi, Roberto; and Gola, Alberto, 5,182,470, Cl. 307-296.400.
Shackelford, Floyd W.: *See*—
Abraham, Robert L.; Moore, Richard E.; Rich, William L.; Shackelford, Floyd W.; Tiller, John R., Jr.; and Briggs, Richard S., Jr., 5,182,804, Cl. 395-600.000.
Shanks, Ian A.: *See*—
Holden, John G.; and Shanks, Ian A., 5,182,490, Cl. 313-485.000.
Shape Inc.: *See*—
Lovecky, Craig; and Rolfe, Richard, 5,182,692, Cl. 360-132.000.
Shapovalov, Vladimir I., to Dmk Tek, Inc. Method for manufacturing porous articles. 5,181,549, Cl. 164-79.000.
Sharif, Sharif, to Zirconium Technology Corporation. Process for preparation of stable aqueous solutions of zirconium chelates. 5,182,408, Cl. 556-55.000.
Sharp Kabushiki Kaisha: *See*—
Maeda, Shigemi; Deguchi, Toshihisa; and Terashima, Shigeo, 5,182,741, Cl. 369-50.000.
Mimasu, Kazuo; Watanabe, Katsuhiko; and Suzuki, Nobutoshi, 5,182,691, Cl. 360-128.000.
Ohtsuka, Yoshihiro; and Masuda, Yoshifumi, 5,182,448, Cl. 250-214.00B.
Okada, Kenji; and Namba, Toyoaki, 5,181,709, Cl. 271-97.000.
Omi, Susumu; and Fujita, Kazuya, 5,182,630, Cl. 257-787.000.
Shimada, Takayuki; Matsushima, Yasuhiro; and Takafuji, Yutaka, 5,182,620, Cl. 257-72.000.
Takata, Souichi; Namba, Toyoaki; Okada, Kenji; and Wakuda, Osamu, 5,181,710, Cl. 271-98.000.
Taneya, Mototaka; Konushi, Fumihiro; Okumura, Toshiyuki; and Takiguchi, Haruhisa, 5,182,758, Cl. 372-46.000.
Yamagishi, Toshio; Kimura, Youichi; Shuto, Tamotsu; and Ito, Tatuya, 5,181,714, Cl. 271-186.000.
Yamamoto, Hiranaga; Takata, Souichi; Wakuda, Osamu; and Namba, Toyoaki, 5,181,706, Cl. 271-11.000.
Shaw, David H.: *See*—
Murphy, William J.; and Shaw, David H., 5,181,998, Cl. 204-157.150.
Sheiman, Jonathan C.: *See*—
Sheiman, Lawrence S.; and Sheiman, Jonathan C., 5,181,741, Cl. 280-845.000.
Sheiman, Lawrence S.; and Sheiman, Jonathan C. Ice block sled. 5,181,741, Cl. 280-845.000.
Sheldrick, Wayne: *See*—
Munich, Randy; Ewing, David; Lo, Tsai; Sheldrick, Wayne; and Chieh, Baldwin, 5,182,771, Cl. 380-5.000.
Shell Oil Company: *See*—
Gilchrist, Robert T., Jr., 5,181,798, Cl. 405-170.000.
Shelstad, Richard J. Filtration assembly. 5,182,008, Cl. 210-139.000.
Shen, Michael C. S.; and Zobkiw, Christopher P., to Acoustic Imaging Technologies Corporation. Ultrasound imaging system and method. 5,182,728, Cl. 367-7.000.
Sherbondy, Ann M.: *See*—
Boffardi, Bennett P.; and Sherbondy, Ann M., 5,182,028, Cl. 210-697.000.
Sherex Chemical Company, Inc.: *See*—
Lagerman, Robert K., 5,182,033, Cl. 252-8.600.
Sherlock, Margaret H.: *See*—
Ting, Pauline C.; Sherlock, Margaret H.; Tom, Wing C.; and Kaminski, James J., 5,182,289, Cl. 514-278.000.
Sherman, Gary A., to Get-A-Head, Inc. Reversible hat assembly. 5,181,277, Cl. 2-195.000.
Sherman, Randy J.; Weilbach, August O.; Hanson, Derald F.; and Smith, C. Dwight, to Lincoln Laser Co. Apparatus for eliminating whirl instability in a gas supported bearing. 5,181,783, Cl. 384-114.000.
Sherwood Medical Company: *See*—
Sunderland, Richard A.; Walker, Clarence L.; and Davis, Mark A., 5,181,842, Cl. 417-474.000.
Shia, Yoshiaki; Mori, Hideaki; Kida, Otojiro; and Taketsugu, Hiroshi, to Nippon Steel Corporation; and Asahi Glass Co., Ltd. Thermocouple temperature sensor and a method of measuring the temperature of molten iron. 5,181,779, Cl. 374-139.000.
Shibasaki, Kazuka: *See*—
Kobayashi, Takaichi; Shibasaki, Kazuka; Hosoi, Takashi; Honda, Masami; and Takahashi, Kazuyoshi, 5,182,698, Cl. 361-395.000.
Shibata, Akiji; and Ando, Nobuo, to Hitachi Cable Limited. Method of receiving wavelength multiplex signals. 5,182,667, Cl. 359-124.000.
Shibata, Hiromasa, to Sortec Corporation. Position detecting method and device therefor as well as aligning device. 5,182,610, Cl. 356-349.000.
Shibata, Kimihiro: *See*—
Sakamoto, Hiroki; Matsuyama, Hidenobu; and Shibata, Kimihiro, 5,182,433, Cl. 219-121.850.
Shibata, Thoru, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Vehicular door lock device. 5,181,754, Cl. 292-216.000.
Shibayama, Yoshinaru; and Ohtake, Takao, to Fuji Xerox Co., Ltd. Multi-screen setting condition display system. 5,182,796, Cl. 395-156.000.
Shieh, K. L.: *See*—
Chen, Hsing; Koo, Horng-Show; Chang, Li; and Shieh, K. L., 5,181,528, Cl. 131-256.000.
Shieng, Chen M. Ski-practicing device. 5,181,894, Cl. 482-70.000.
Shimada, Hiroyuki: *See*—
Ashikawa, Noboru; Yaguchi, Bunsho; Yasuda, Toyoshi; Takano, Masami; Ohhashi, Akihito; Shimada, Hiroyuki; and Akioka, Masahiro, 5,181,893, Cl. 475-203.000.
Shimada, Takayuki; Matsushima, Yasuhiro; and Takafuji, Yutaka, to Sharp Kabushiki Kaisha. Active matrix display device. 5,182,620, Cl. 257-72.000.
Shimada, Toshiro, to Kabushiki Kaisha Toshiba. Brushless motor control circuit. 5,182,500, Cl. 318-254.000.
Shimadzu Corporation: *See*—
Hayashi, Shigeki, 5,182,453, Cl. 250-309.000.
Shimano, Inc.: *See*—
Yasui, Toshihiko, 5,181,336, Cl. 43-24.000.
Shimasaki, Shunichi: *See*—
Ling, Nicholas C. K.; Ueno, Naoto; Shimasaki, Shunichi; Esch, Frederick S.; Ying, Shao-Yao; and Guillemin, Roger C. L., 5,182,375, Cl. 536-23.500.
Shimizu, Hisashi: *See*—
Shiobara, Toshio; and Shimizu, Hisashi, 5,182,351, Cl. 526-279.000.
Shimizu, Katsuichi: *See*—
Masuda, Shunichi; Shimizu, Katsuichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 5,182,597, Cl. 355-205.000.
Shimizu, Satoshi: *See*—
Ohkoda, Keiji; Kudo, Tomohiro; Shimizu, Satoshi; and Kawasaki, Keiichi, 5,181,715, Cl. 271-272.000.
Shimizu, Shigeichi. Seat belt with an automatic unlocking device. 5,181,738, Cl. 280-801.000.
Shimizu, Yasumoto: *See*—
Miyake, Hiroyuki; Abe, Tsutomu; Ito, Hisao; Hotta, Hiroyuki; Shimizu, Yasumoto; and Sakai, Yoshihiko, 5,182,625, Cl. 257-443.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Shiobara, Toshio; and Shimizu, Hisashi, 5,182,351, Cl. 526-279.000.
Shinbori, Kenichi; Maeda, Nasaya; and Sakaegi, Yuji, to Canon Kabushiki Kaisha. Electronic apparatus which can discriminate between different power sources which it uses. 5,182,546, Cl. 340-636.000.
Shindo, Takashi: *See*—
Suzuki, Masahiro; Nozaki, Kenji; Kajitani, Makoto; Yasumoto, Mitsugi; Ono, Naohiko; and Shindo, Takashi, 5,182,284, Cl. 514-255.000.
Shingler, Thomas M., to United Dominion Industries, Inc. Standing-seam roof panel system. 5,181,360, Cl. 52-520.000.
Shinjou, Atsuko: *See*—
Kishi, Fumio; Akaike, Masatake; Yamamoto, Keisuke; Motoi, Taiko; Kaneko, Norio; Iwatate, Fujio; Ohmi, Kazuaki; Kawasaki, Takehiko; and Shinjou, Atsuko, 5,182,253, Cl. 505-1.000.
Shinohara, Sueharu: *See*—
Igarashi, Toshio; Shinohara, Sueharu; Tatsumi, Masayuki; Hikasa, Tadashi; and Mendori, Hiroaki, 5,182,167, Cl. 428-318.600.

Shinonaga, Hideo: *See—*
Abe, Hiroomi; Nagaoka, Kenji; Nishio, Taichi; Shinonaga, Hideo; and Sanada, Takashi, 5,182,336, Cl. 525-132.000.

Shinwa Denshi Kabushiki Kaisha: *See—*
Sakai, Kikuo, 5,181,983, Cl. 156-523.000.

Shinzo, Toshiaki: *See—*
Tsuji, Toshinori; Hosoya, Koichi; Tsukimoto, Fumio; Ashida, Tatsuya; Okubo, Katsuyuki; Bokuhara, Tetsuo; and Shinzo, Toshiaki, 5,181,668, Cl. 242-54.00R.

Shiobara, Masataka: *See—*
Yanaba, Shigeru; Shiobara, Masataka; Masamizu, Koji; Morohara, Kiyoshi; and Abe, Seiji, 5,182,044, Cl. 252-174.240.

Shiobara, Toshio; and Shimizu, Hisashi, to Shin-Etsu Chemical Co., Ltd. Thermosetting resin compositions. 5,182,351, Cl. 526-279.000.

Shiota, Shuichiro: *See—*
Yamamoto, Tadashi; Seno, Takao; and Shiota, Shuichiro, 5,182,002, Cl. 204-210.000.

Shirai, Nobuo; and Kasasaku, Takami, to Fujitsu Limited. Modem having speed notifying means. 5,182,762, Cl. 375-122.000.

Shirakawa, Junji: *See—*
Yamada, Masato; Shirakawa, Junji; and Uno, Kazuo, 5,182,605, Cl. 355-274.000.

Shirakura, Masaru: *See—*
Iwai, Noriyuki; Sasaki, Kimito; Yano, Masaru; Wakimoto, Fumiyoshi; Tokunaga, Wataru; and Shirakura, Masaru, 5,182,676, Cl. 359-841.000.

Shirasaki, Yasufumi; and Ashida, Shinichiro, to Santen Pharmaceutical Co., Ltd.; and Daiichi Pharmaceutical Co., Ltd. Nootropic agent. 5,182,276, Cl. 514-224.200.

Shirey, Lawrence A.: *See—*
Kozlowski, Lawrence J.; and Shirey, Lawrence A., 5,181,602, Cl. 200-43.015.

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Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Shiwaku, Noboru, to Texas Instruments Incorporated. Analog-to-digital converter for high speed low power applications. 5,182,560, Cl. 341-158.000.

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Shuler, Patrick J., to Chevron Research and Technology Company. Method for prolonging the useful life of polymeric or blended scale inhibitors injected within a formation. 5,181,567, Cl. 166-279.000.

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Shuto, Tamotsu: *See—*
Yamagishi, Toshio; Kimura, Youichi; Shuto, Tamotsu; and Ito, Tatuya, 5,181,714, Cl. 271-186.000.

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Siegel, Bernd; and Patsch, Manfred, to BASF Aktiengesellschaft. Doubled phenyl- or naphthyl-azobenzenes having a plurality of reactive groups and intermediates thereof. 5,182,371, Cl. 534-612.000.

Siegel, Marvin; Donohue, William; and Francois, Michael J., to Board of Trustees operating Michigan State University. Miniaturized data communication and identification system. 5,182,543, Cl. 340-531.000.

Siegner, Helge; and Prottengeier, Edgar, to Suspa Compart AG. Reversible impact damper, in particular for vehicles. 5,181,589, Cl. 188-374.000.

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Ertel, Gernot; Brabetz, Ludwig; and Schwarz, Waldemar, 5,182,523, Cl. 324-663.000.

Siemens Energy & Automation, Inc.: *See—*
Burke, Robert R., 5,182,482, Cl. 310-89.000.

Siemer, Hubert: *See—*
Jordens, Ernst-Gunter; and Siemer, Hubert, 5,181,784, Cl. 384-222.000.

Sigma Tek, Inc.: *See—*
Bishop, Jerry B.; Schwind, Francis A.; and Sawyer, David B., 5,181,844, Cl. 418-152.000.

Signorini, Massimo: *See—*
Bruzzese, Tiberio; Signorini, Massimo; Fanciano, Carlo A.; and Termini, Roberta, 5,182,265, Cl. 514-18.000.

Silbermann, Klaus: *See—*
Camezon, Raymond E.; and Silbermann, Klaus, 5,181,459, Cl. 99-546.000.

Silicon Graphics, Inc.: *See—*
Haeberli, Paul E., 5,182,548, Cl. 340-706.000.

Silicon Systems, Inc.: *See—*
Yamasaki, Richard G.; and De Veirman, Geert A., 5,182,477, Cl. 307-494.000.

Sillars, Ian. Combined offset and flexographic printing and decorating system. 5,181,471, Cl. 101-483.000.

Simard, Yves M. Ladder leveling adapter. 5,181,584, Cl. 182-201.000.

Simmonds, S. Neil, to 372604 B.C. Ltd. Conditioning and charging circuit for nickel-cadmium batteries. 5,182,509, Cl. 320-14.000.

Simon, Karl-H.: *See—*
Guttner, Arnold; Herrmann, Jobst; and Simon, Karl-H., 5,181,306, Cl. 29-413.000.

Simone, Nicholas. Cutting deck-mounted auxiliary operator control handle transformer unit and method for converting walk behind mid-size rotary mower into riding mower. 5,181,370, Cl. 56-14.700.

Singbartl, Gunther: *See—*
Bartscher, Peter; Singbartl, Gunther; Petersen, Erwin; and Ulrich, Helmut, 5,181,418, Cl. 73-146.300.

Singer, Debra L.: *See—*
Pettit, Paul H., Jr.; Singer, Debra L.; and Kaufman, Marvin L., 5,182,337, Cl. 525-176.000.

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Poldervaart, Leendert; and Perratone, Rene , 5,181,748, Cl. 285-24.000.

Sinks, Rod G.: *See—*
Hurlbut, Amy O.; Riley, Glen M.; and Sinks, Rod G., 5,182,746, Cl. 370-100.100.

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Bitzer, Bernd, 5,181,666, Cl. 242-47.010.

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Wilson, James B. S.; Serle, Peter M.; and Siroky, Zdenek, 5,181,794, Cl. 404-6.000.

Sitte, Hellmuth; Hassig, Helmut; Kunz, Armin; and Neumann, Klaus. Device for controlling the drive and forward feed of microtomes, particularly ultramicrotomes. 5,181,443, Cl. 83-72.000.

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Burton, Frederick G.; Cataldo, Dominic A.; Cline, John F.; Skiens, W. Eugene; and Van Voris, Peter, 5,181,952, Cl. 504-347.000.

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Skorpenske, Richard G.; and Schrock, Alan K., to Dow Chemical Company. Isocyanate-reactive composition and process for preparing a flexible polyurethane foam. 5,182,310, Cl. 521-116.000.

Sky Aluminum Co., Ltd.: *See—*
Komatsubara, Toshio; Tagata, Tsutomu; and Matsuo, Mamoru, 5,181,969, Cl. 148-552.000.

Slane, Melvin B.: *See—*
Thurman, Dan L.; Slane, Melvin B.; Berndt, Charles F.; and Olszewski, John A., 5,181,375, Cl. 51-287.000.

Slightom, Jerry L.; and Tepfer, David A., to Lubrizol Genetics, Inc. T-DNA promoters. 5,182,200, Cl. 435-172.300.

Slotkowski, Kenneth G.; Michaels, Paul A.; Macks, Harold R.; and Ewald, Henry J., to Lectron Products, Inc.; and Ford Motor Company. Automatic headlamp dimmer. 5,182,502, Cl. 315-159.000.

Smalley, Dennis R.: *See—*
Allison, Joseph W.; Richter, Jan; Childers, Craig M.; Smalley, Dennis R.; Hull, Charles W.; and Jacobs, Paul F., 5,182,055, Cl. 264-22.000.
Spence, Stuart T.; and Smalley, Dennis R., 5,182,056, Cl. 264-22.000.

Smart, Bruce E.: *See—*
Feiring, Andrew E.; Krespan, Carl G.; Resnick, Paul R.; Smart, Bruce E.; Treat, Theodore A.; and Wheland, Robert C., 5,182,342, Cl. 526-206.000.

Smetana, Stephen B.: *See—*
Wikstrom, Jan A.; Birrittella, Mark S.; Kiefer, David; Smetana, Stephen B.; and Swanson, Vernon W., 5,182,473, Cl. 307-454.000.

Smets, Pierre; and Zalisz, Rene, to Roussel Uclaf. Sulfate derivatives of galactan extracted from Klebsiella. 5,182,378, Cl. 536-4.100.

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Bajorek, Jay E.; Cox, Austin E.; Kovack, Eugene S.; Lionetti, Michael S.; and Smisko, Joe, 5,182,541, Cl. 340-428.000.

Smith, C. Dwight: *See—*
Sherman, Randy J.; Weilbach, August O.; Hanson, Derald F.; and Smith, C. Dwight, 5,181,783, Cl. 384-114.000.

Smith, Edward H.: *See—*
Pirl, William E.; Smith, Edward H.; Roth, Charles H., Jr.; Lutz, Rodney A.; and Anderson, John J., 5,182,429, Cl. 219-121.630.

Smith, Forrest K.: *See—*
Woodworth, George K.; and Smith, Forrest K., 5,182,464, Cl. 307-87.000.

Smith, Harold C. Removable hanger. 5,181,683, Cl. 248-227.000.

Smith, Lester L.: *See—*
Layton, Mark R.; Palmer, Ramon L., Jr.; and Smith, Lester L., 5,181,851, Cl. 434-226.000.

Smith, Marshall D. Reusable diaper. 5,181,915, Cl. 604-385.100.

Smith, P. A. Joel: *See—*
Hill, Russell J.; and Smith, P. A. Joel, 5,182,488, Cl. 313-446.000.

Smith, R. Paul; and Price, Michael I., to Recovermat Technologies, Inc. Method of making daily cover for a landfill. 5,181,803, Cl. 405-129.000.

Smith, Richard: *See—*
Dyer, Cheryl A.; Curtiss, Linda K.; and Smith, Richard, 5,182,364, Cl. 530-324.000.

Smith, Rodney P.; and Vens, Gregory C., to Kartridg Pak Co., The. Crimper-propellant fill head. 5,181,366, Cl. 53-470.000.

Smith, Ross E.: *See—*
Cooper, Tommy G.; Smith, Ross E.; and Macha, Emil S., 5,182,707, Cl. 364-413.110.

Smith, Todd S.: *See—*
Bolesky, Richard; Smith, Todd S.; and Whitcraft, Charles E., Jr., 5,181,928, Cl. 623-23.000.

Smith, Warren T.: *See—*
Garvey, Joseph F.; Minion, Aaron A.; and Smith, Warren T., 5,181,365, Cl. 53-455.000.

Smiths Industries Medical Systems Inc.: *See—*
Bell, Craig J., 5,181,908, Cl. 604-24.000.

Snap-on Tools Corporation: *See—*
Braun, Robert D.; Crass, Matthew M.; Piehl, James R.; Schend, David J.; Wollert, Gary S.; Mueckl, Jerry W.; and Becker, Thomas P., 5,182,512, Cl. 324-175.000.

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Carpenter, Lester E.; Schmitt, Wayne I.; Snell, Laurence; Bieber, David; Stucke, Donald W.; and Waltzer, Jeremy S., 5,181,590, Cl. 190-18.00A.

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Michel, M. John; Snyder, Frederick D.; and Emany, Venkateswara R., 5,181,507, Cl. 128-201.250.

SOBREVIN Societe de brevets industriels-Etablissement: *See—*
Deiuri, Adriano, 5,181,544, Cl. 139-452.000.

Societe Francaise d'Aerosols et de Bonchage: *See—*
Behar, Alain, 5,181,658, Cl. 239-493.000.

Societe National d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See—*
Lagain, Georges L., 5,182,430, Cl. 219-121.630.

Societe Nationale d'Etude et Moteurs d'Aviation S.N.E.: *See—*
Lardellier, Alain, M. J.; and Saillot, Patrick W. R., 5,181,675, Cl. 244-54.000.

Sodick Co., Ltd.: *See—*
Kaneko, Yuji, 5,182,474, Cl. 307-465.000.

Sohda, Yoshio: *See—*
Uemura, Seiichi; Sohda, Yoshio; Kato, Osamu; Kouno, Takefumi; and Kihara, Tsutomu, 5,181,979, Cl. 156-89.000.

Soikowski, Carmen: *See—*
Hui, Henry K.; Divers, George A., III; and Soikowski, Carmen, 5,182,353, Cl. 528-31.000.

Sokolich, Marko; and Bardai, Zaher, to Hughes Aircraft Company. Method of making microelectronic field emission device with air bridge anode. 5,181,874, Cl. 445-24.000.

Solen, Kenneth A.: *See—*
Winters, Suzanne; Solen, Kenneth A.; Sanders, Clifton G.; Mortensen, J. D.; and Berry, Gaylord, 5,182,317, Cl. 523-112.000.

Solli, Ann: *See—*
DeRoo, John E.; Frame, Robert C.; and Solli, Ann, 5,182,752, Cl. 371-37.700.

Solomon, Rodney J.; Mason, Martin K.; Gruner, George; and Fearnside, James T., to Hewlett-Packard Company. Transducer positioning system. 5,181,514, Cl. 128-660.090.

Song, Chang J. Frame lock mechanism for a key light. 5,181,927, Cl. 362-116.000.

Sonobe, Tadasi: *See—*
Fukuda, Takuya; Ohue, Michio; and Sonobe, Tadasi, 5,182,495, Cl. 315-111.410.

Sony Corporation: *See—*
Hirota, Isao, 5,182,648, Cl. 358-213.110.
Iizuka, Tetsuya; Yonemoto, Kazuya; Wada, Kazushi; Nakamura, Satoshi; and Harada, Koichi, 5,182,622, Cl. 257-231.000.
Katori, Kenji; Hayakawa, Masatoshi; Aso, Koichi; Hayashi, Kazuhiko; and Kajiwara, Kazuo, 5,182,690, Cl. 360-120.000.
Kikuchi, Akihiro; Kondo, Toshiharu; Kohashi, Takashi; Kato, Funiaki; and Hirota, Katsuaki, 5,182,636, Cl. 358-41.000.
Kizu, Sojiro; Saito, Yutaka; Ninomiya, Ichiro; and Sasho, Hidehiko, 5,182,677, Cl. 360-14.200.
Ohmori, Kiyoshi; Iwaasa, Shoji; and Fujita, Goro, 5,182,742, Cl. 369-116.000.
Sakamoto, Satoshi, 5,182,481, Cl. 310-13.000.
Sasaki, Tadao, 5,182,561, Cl. 341-166.000.
Sato, Junichi, 5,182,221, Cl. 437-67.000.
Takano, Masayuki, 5,182,640, Cl. 358-86.000.
Urata, Kaoru, 5,182,520, Cl. 328-142.000.
Watanabe, Tetsu; Kawashima, Tetsuji; and Fujita, Goro, 5,182,734, Cl. 369-13.000.
Yamashita, Keitaro; and Ogura, Eiji, 5,182,680, Cl. 360-60.000.

Sony Trans Com Inc.: *See—*
Robak, Edward; and Reh, Carter K., 5,181,771, Cl. 312-7.200.

Soodjinda, Churchai T.: *See—*
Creasman, Edwin A.; Paul, Thomas R.; Weber, Kenneth E.; Navarrete, David R.; McCullough, Jimmy D.; and Soodjinda, Churchai T., 5,182,053, Cl. 264-1.400.

Soon-Ho, Park, to Samsung Electronics Co., Ltd. Position control device and method of a robot system. 5,182,506, Cl. 318-568.100.

Sorenson, James L.: *See—*
Reynolds, Valdon G.; Sorenson, James L.; and Reynolds, Gordon S., 5,181,916, Cl. 606-16.000.

Sorenson Laboratories, Inc.: *See—*
Reynolds, Valdon G.; Sorenson, James L.; and Reynolds, Gordon S., 5,181,916, Cl. 606-16.000.

Sortec Corporation: *See—*
Shibata, Hiromasa, 5,182,610, Cl. 356-349.000.

Soukup, Vaclav. Natural extract based hair reshaping composition. 5,182,110, Cl. 424-195.100.

Sounart, Lawrence R.: *See—*
Hudgins, Richard D.; Sounart, Lawrence R.; and Storck, Alan G., 5,181,767, Cl. 301-37.370.

SPA Societa' Prodotti Antibiotici S.p.A.: *See—*
Bruzzese, Tiberio; Signorini, Massimo; Fanciano, Carlo A.; and Termini, Roberta, 5,182,265, Cl. 514-18.000.

Spadoni, Vittorio. Wing shooting target. 5,181,724, Cl. 273-363.000.

Sparton Corporation: *See—*
Pattock, Greg R., 5,181,592, Cl. 192-4.00A.

Spector, George: *See—*
Escoto, Dario; and Spector, George, 5,181,531, Cl. 132-308.000.

Spector, Marshall L., to Lehigh University. Biological process for enhanced removal of ammonia, nitrite, nitrate, and phosphate from wastewater. 5,182,021, Cl. 210-605.000.

Spectra, Inc.: *See—*
Creagh, Linda T.; and Spehrley, Charles W., Jr., 5,182,571, Cl. 346-1.100.

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Spence, Stuart T.; and Smalley, Dennis R., to 3D Systems, Inc. Stereolithography method and apparatus employing various penetration depths. 5,182,056, Cl. 264-22.000.

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Zaiser, Wolfgang; Merkle, Hans; Wagner, Gerhard; and Spengler, Gerhard, 5,181,431, Cl. 74-333.000.

Speranza, George P.: *See—*
Shirodkar, Shailaja M.; and Speranza, George P., 5,182,038, Cl. 252-51.50A.

Sperna Weiland, Jan A. E.: *See—*
van Hattem, Jan C.; and Sperna Weiland, Jan A. E., 5,181,753, Cl. 285-205.000.

Spielmann, Susan A.; and Spielmann, Thomas G. Disposable receptor for surgical sharps. 5,181,609, Cl. 206-370.000.

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Spielmann, Susan A.; and Spielmann, Thomas G., 5,181,609, Cl. 206-370.000.

Spies, Karl H.: *See—*
Sausner, Andreas; and Spies, Karl H., 5,181,492, Cl. 123-337.000.

Spofford, Bryan T.; and Christopher, Kent L. Transtracheal catheter system. 5,181,509, Cl. 128-207.140.

Spojene Podniky Pro Zdravotnickou Vyrobu: *See—*
Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , 5,182,285, Cl. 514-255.000.

Spoorenberg, Christophorus L., to Oce-Nederland, B.V. Device for discharging sheets from the bottom of a stack. 5,181,711, Cl. 271-98.000.

Springer, Helmut: *See—*
Weber, Jurgen; Lappe, Peter; and Springer, Helmut, 5,182,400, Cl. 546-250.000.

Sproule, Patrick A.: *See—*
McFalls, Charles S., Jr.; Sproule, Patrick A.; and Mullins, Michael A., 5,182,727, Cl. 365-230.060.

Spulgis, Edwin A. Apron to be used in a seated position. 5,181,275, Cl. 2-48.000.

SPX Corporation: *See—*
Manz, Kenneth W., 5,181,391, Cl. 62-129.000.

Square Grip Limited: *See—*
Chana, Palvinder; and Clapson, John D., 5,181,359, Cl. 52-253.000.

Srinath, Dharapuram: *See—*
Stouffer, Ronald D.; and Srinath, Dharapuram, 5,181,660, Cl. 239-589.100.

SS Pharmaceutical Co., Ltd.: *See—*
Kurazumi, Toshiaki; Mizuno, Hireyuki; Imamori, Katsumi; and Iwasa, Akira, 5,182,112, Cl. 424-439.000.

Stack, Gary P., to American Home Products Corporation. Psychotropic piperidinylmethyl benzodioxans. 5,182,292, Cl. 514-321.000.

Stadler, Peter: *See—*
Merkel, Gerd; Vogt, Wilfried; Glaunsinger, Georg; Stadler, Peter; Zander, Claus-Peter; Maass, Jurgen; Schmitt, Gernot; Necker, Thomas; and Becker, Willi, 5,181,469, Cl. 101-415.100.

Stahl, Kermit E.: *See—*
Hannah, Marcia G.; Mehrer, George W.; Noone, Michael J.; Stahl, Kermit E.; and Quaranta, Joseph, 5,181,361, Cl. 52-535.000.

Stahman, Kenneth J.: *See—*
Mark, Harold; and Stahman, Kenneth J., 5,181,960, Cl. 106-419.000.

Stambaugh, Tommy L.: *See—*
McCoy, Brian K.; and Stambaugh, Tommy L., 5,181,569, Cl. 166-317.000.

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Keys, James F.; and Larsen, Douglas C., 5,181,341, Cl. 49-477.000.

Standex International Corporation: *See—*
Goekler, Lewis E.; and Chamberlin, Edward R., 5,182,545, Cl. 340-620.000.

Standish, James K.: *See—*
Fish, Donald D.; and Standish, James K., 5,181,503, Cl. 125-21.000.

Stankus, John C.; Stewart, Eugene H.; and Grissinger, Glen S., to Jennmar Corporation. Mine roof anchor having adjustable resin retaining washer. 5,181,800, Cl. 405-259.600.

Stanley Electric Co., Ltd.: *See—*
Clerc, Jean-Frederic, 5,182,664, Cl. 359-93.000.

Stanley, Gerald R., to Crown International, Inc. Amplifier selector for magnetic resonance imaging machine. 5,182,465, Cl. 307-115.000.

Stannis, Gordon J.: *See—*
Arbisi, Thomas E.; Dykstra, Ronald A.; and Stannis, Gordon J., 5,182,675, Cl. 359-841.000.

Stanwich, Lawrence J.; Berk, Kenneth J.; Berk, Fredrick M.; and Berk, Donald A., to Pulpdent Corporation. Small object handling device, assembly and method of manufacture. 5,181,755, Cl. 294-1.100.

Star Partners: *See—*
Le Gigan, Dominique, 5,181,616, Cl. 209-31.000.

Stark, Casper F.: *See—*
Dumbleton, John H.; Lin, Ruey Y.; Stark, Casper F.; and Crippen, Thomas E., 5,181,930, Cl. 623-23.000.

Starkey, Gene R.: *See—*
Pollack, Richard S.; Phelan, John R.; Ames, Ronald M.; Starkey, Gene R.; Brown, Robert W.; Belski, Gary T.; and Dunn, William F., 5,181,975, Cl. 152-152.100.

State University of New York, The: *See—*
Hickey, Donald D., 5,181,517, Cl. 128-673.000.

Stec, Philip F., to General Electric Company. Trenched brush seal. 5,181,728, Cl. 277-53.000.

Steitz, Richard R.; Christie, Diane M.; Neumann, Eugene F.; August, Melvin C.; and Nelson, Stephen, to Cray Research, Inc. Method of fabricating metallized chip carriers from wafer-shaped substrates. 5,182,420, Cl. 174-52.400.

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Steltenkamp, Robert J., to Colgate-Palmolive Co. N-aryl and N-cycloakyl neoalkanamide insect repellents. 5,182,305, Cl. 514-629.000.

Stemmer, Gottfried, to Geimuplast Peter Mundt GmbH & Co. KG. Method and apparatus for inserting slide frames or film strips into the pockets of a film jacket. 5,181,367, Cl. 53-473.000.

Stendahl, Kjell: *See—*
Kvant, Magnus; and Stendahl, Kjell, 5,182,094, Cl. 423-462.000.

Stephens, Michael W., to AMF Bowling, Inc. Bowling alley bumper system. 5,181,716, Cl. 273-51.000.

Stephenson, Maurice A. S., to Du Pont de Nemours, E. I., and Company. Flexible etch-resistant finishes with siloxane cross-linking. 5,182,174, Cl. 428-450.000.

Stephenson, Stanley W., III, to Eastman Kodak Company. High resolution thermal printing by imaging a hard copy image in vertical and horizontal increments smaller than the pixel pitch of a video imager array. 5,182,652, Cl. 358-296.000.

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Stewart, Eugene H.: *See—*
Stankus, John C.; Stewart, Eugene H.; and Grissinger, Glen S., 5,181,800, Cl. 405-259.600.

Stich, Frederick A.; Baxter, Richard V., Jr.; Podewils, Herbert A.; and Layden, David L., to Best Power Technology, Inc. Inverter and battery testing for uninterruptible power systems. 5,182,518, Cl. 324-511.000.

Stidsen, Carsten E.: *See—*
Jorgensen, Anker S.; Stidsen, Carsten E.; Faarup, Peter; Gronvald, Frederik C.; and Nielsen, Flemming E., 5,182,279, Cl. 514-250.000.

Stites, John T., III; and Austry, Jerome M., to Head Sports, Inc. Golf club construction. 5,181,720, Cl. 273-80.200.

Stockbridge, Dennis M.: *See—*
Nash-Stevenson, Shelia K.; and Stockbridge, Dennis M., 5,182,789, Cl. 385-137.000.

Stockner, Alan R.: *See—*
Ausman, Thomas G.; Longman, Douglas E.; and Stockner, Alan R., 5,181,494, Cl. 123-446.000.

Stolar, Inc.: *See—*
Lapeyre, James M., deceased; Greve, Christopher; and O'Connor, Ronald M., 5,181,879, Cl. 452-160.000.
Stolarczyk, Larry G., 5,181,934, Cl. 299-1.200.

Stolarczyk, Larry G., to Stolar, Inc. Method for automatically adjusting the cutting drum position of a resource cutting machine. 5,181,934, Cl. 299-1.200.

Stollewerk, Reinfried: *See—*
Hubricht, Gerhard; Schunk, Bernd; Stollewerk, Reinfried; and Peters, Jorg, 5,181,673, Cl. 244-3.120.

Stone, Lawrence A.: *See—*
Fitzgibbons, Patrick J.; Lee, Ho C.; Stone, Lawrence A.; and Van Note, Paul C., 5,181,465, Cl. 101-103.000.

Stone & Webster Engineering Corp.: *See—*
Karafian, Maxim; and Tsang, Irving C., 5,181,937, Cl. 48-95.000.
Labbe, Donald E.; Line, Lawrence J.; Geary, Christopher T.; Leigh, Mark C.; and Donohue, John M., 5,181,482, Cl. 122-392.000.

Stoner, Robert B., to Arizona Carbon Foil Company, Inc., The. Eyeglasses with controllable refracting power. 5,182,585, Cl. 351-41.000.

Stoppel, Karl-Anton: *See—*
Vossen, Franz; and Stoppel, Karl-Anton, 5,181,640, Cl. 225-93.000.

Storck, Alan G.: *See—*
Hudgins, Richard D.; Sounart, Lawrence R.; and Storck, Alan G., 5,181,767, Cl. 301-37.370.

Stork Titan B.V.: *See—*
Kusters, Johannes K. O.; and Van Der Putten, Joost W. H., 5,182,120, Cl. 425-238.000.

Storrs, Stephen B.; and Schorey, Jeffrey S., to Monsanto Company. Method for purifying somatotropin monomers. 5,182,369, Cl. 530-647.000.

Stouffer, Ronald D.; and Srinath, Dharapuram, to Bowles Fluidics Corporation. Low cost, low pressure, feedback passage-free fluidic oscillator with stabilizer. 5,181,660, Cl. 239-589.100.

Straeter, Joseph G.: *See—*
Weder, Donald E.; and Straeter, Joseph G., 5,181,339, Cl. 47-72.000.

Streicher, Robert M.: *See—*
Koch, Rudolf; and Streicher, Robert M., 5,181,926, Cl. 623-22.000.

Stricklen, Phil M.; Hasenberg, Daniel M.; and Rooney, Patrick, to Phillips Petroleum Company. Process for the copolymerization of 4-methyl-1-pentene. 5,182,330, Cl. 525-247.000.

Strom, Lars-Magnus: *See—*
Eklund, Nils O.; Olsson, Johan L.; and Strom, Lars-Magnus, 5,182,164, Cl. 428-234.000.

Stroud, James W., III; and Dodds, John F., to Allen-Bradley Company, Inc. Injection molding controller with controlled variable learning. 5,182,716, Cl. 364-476.000.

Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. Fungicides and plant-growth controlling agents. 5,182,277, Cl. 514-231.200.

Stryker Corporation: *See—*
Oppermann, Hermann; Kuberasampath, Thangavel; Rueger, David C.; and Ozkaynak, Engin, 5,182,365, Cl. 530-326.000.

Stucke, Donald W.: *See—*
Carpenter, Lester E.; Schmitt, Wayne L.; Snell, Laurence; Bieber, David; Stucke, Donald W.; and Waltzer, Jeremy S., 5,181,590, Cl. 190-18.00A.

Stuhr, Leslie P., to Honeywell Inc. Spring return rotary actuator. 5,182,498, Cl. 318-15.000.

Sturc, Antonin: *See—*
Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , 5,182,285, Cl. 514-255.000.

Sturm, Wolfgang: *See—*
Hessel, Joachim; Koch, Rolf; and Sturm, Wolfgang, 5,181,746, Cl. 285-3.000.

Styckiewicz, Carl J.: *See—*
Leonard, Robert F.; and Styckiewicz, Carl J., 5,181,422, Cl. 73-715.000.

Suda, Shigeyuki: *See—*
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Mizusawa, Nobutoshi; Suda, Shigeyuki; Nose, Noriyuki; and Kariya, Takao, 5,182,615, Cl. 356-400.000.

Suda, Yasuo; Nagano, Akihiko; and Konishi, Kazuki, to Canon Kabushiki Kaisha. Optical apparatus having visual axis detector and determining whether eyeglasses are worn. 5,182,443, Cl. 250-201.200.

Suda, Yasuo: *See—*
Ishizaki, Akira; Suzuki, Kenji; Ohtaka, Keiji; and Suda, Yasuo, 5,182,658, Cl. 358-483.000.

Suetsugu, Masaru: *See—*
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Sugatsune Industrial Co., Ltd.: *See—*
Masatoshi, Kawanabe, 5,181,587, Cl. 188-1.120.

Sugi, Hikaru: *See—*
Yoshimi, Tomohisa; Iwama, Shinji; Kajino, Yuuichi; and Sugi, Hikaru, 5,181,654, Cl. 236-91.00C.

Sugie, Masayuki: *See—*
Edo, Hiroshi; Bannai, Takashige; Hayashi, Toshihiro; and Sugie, Masayuki, 5,182,123, Cl. 426-19.000.

Sugihara, Yasumasa: *See—*
Mukai, Hiromu; and Sugihara, Yasumasa, 5,182,672, Cl. 359-652.000.

Sugimoto, Kouji: *See—*
Matsui, Shigetomo; Uenishi, Masahiro; Iuchi, Sadao; Sugimoto, Kouji; Itoga, Kouyu; Harada, Tetsuzo; Michiba, Kouji; Onda, Katsuhiro; and Okumura, Takaaki, 5,182,775, Cl. 382-8.000.

Sugino, Toshio: *See—*
Inoue, Naoshi; Yoshida, Shigeo; and Sugino, Toshio, 5,182,650, Cl. 358-296.000.

Sugita, Masanori: *See—*
Ogawa, Osamu; Kishi, Ikuo; Tahara, Yoshiyuki; and Sugita, Masanori, 5,182,267, Cl. 514-34.000.

Sugitani, Yoshihisa; and Matsubara, Isamu, to Yoshida Kogyo K.K. Method for lifting and guiding elements on building site. 5,181,825, Cl. 414-786.000.

Sugiura, Masaki: *See—*
Iwasaki, Tameo; Kondo, Kazuhiko; Matsuoka, Yuzo; Matsumoto, Mamoru; and Sugiura, Masaki, 5,182,404, Cl. 548-237.000.

Sugiura, Yutaka: *See—*
Hashimoto, Shigeo; and Sugiura, Yutaka, 5,182,131, Cl. 427-8.000.

Sugizaki, Tsugio: *See*—
Kakita, Akihiko; Sugizaki, Tsugio; and Fujii, Yozo, 5,182,602, Cl. 355-271.000.
Sul, Tae H. Earthquake resistant building support system. 5,181,356, Cl. 52-167.0DF.
Sullivan, Timothy A.: *See*—
Gersdorff, Detlef G.; Giganti, John J.; McCown, Phillip W.; and Sullivan, Timothy A., 5,182,642, Cl. 358-133.000.
Sullivan, Vincent: *See*—
Chen, Paul, Sr.; Sullivan, Vincent; Dolce, Thomas; and Jaffe, Mike, 5,182,334, Cl. 525-397.000.
Sulzer Brothers Limited: *See*—
Koch, Rudolf; and Streicher, Robert M., 5,181,926, Cl. 623-22.000.
Sulzer Medizinaltechnik AG: *See*—
Gschwend, Norbert; and Koch, Rudolf, 5,181,924, Cl. 623-20.000.
Sumitomo Chemical Company, Limited: *See*—
Abe, Hiroomi; Nagaoka, Kenji; Nishio, Taichi; Shinonaga, Hideo; and Sanada, Takashi, 5,182,336, Cl. 525-132.000.
Furuta, Motonobu; and Tsuji, Mitsuji, 5,182,151, Cl. 428-36.920.
Igarashi, Toshio; Shinohara, Sueharu; Tatsumi, Masayuki; Hikasa, Tadashi; and Mendori, Hiroaki, 5,182,167, Cl. 428-318.600.
Sagawa, Seiji; Kano, Toshio; Yachigo, Shinichi; and Ida, Kanako, 5,182,390, Cl. 544-222.000.
Sumitomo Electric Industries, Ltd.: *See*—
Fujihira, Mitsuaki, 5,182,218, Cl. 437-22.000.
Hashida, Koichi; and Takata, Koji, 5,181,534, Cl. 137-501.000.
Itozaki, Hideo; Hattori, Hisao; Harada, Keizo; and Higaki, Kenjiro, 5,182,256, Cl. 505-1.000.
Nakano, Minoru; and Nomura, Toshio, 5,181,953, Cl. 75-237.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Ochiai, Kiyoshi, 5,181,978, Cl. 152-541.000.
Summers Manufacturing Company, Inc.: *See*—
Almen, Peter D., 5,181,573, Cl. 172-459.000.
Sumner, Roy L., to Farradyne Systems, Inc. Cell messaging process for an in-vehicle traffic congestion information system. 5,182,555, Cl. 340-905.000.
Sundararaman, Padmanabhan: *See*—
Martz, Jonathan T.; Schimmel, Karl F.; Sundararaman, Padmanabhan; and Walters, David N., 5,182,355, Cl. 528-75.000.
Sunderland, Richard A.; Walker, Clarence L.; and Davis, Mark A., to Sherwood Medical Company. Peristaltic infusion device. 5,181,842, Cl. 417-474.000.
Sundley, Raymond L.: *See*—
Lewis, Terence; Bansal, Harjinder S.; Sundley, Raymond L.; Bartley, Michael R.; Hepworth, Walter; Gilman, David J.; Kay, Ian T.; and Collins, David J., 5,182,402, Cl. 548-204.000.
Sunkara, Sai P.; and Jones, Winton D., to Merrell Dow Pharmaceuticals Inc. Treatment of multi-drug resistant tumors with pyridyloxazole-2-ones. 5,182,293, Cl. 514-340.000.
Suspa Compart AG: *See*—
Siegner, Helge; and Prottengeier, Edgar, 5,181,589, Cl. 188-374.000.
Sutter Instrument Company: *See*—
Belgum, Jack H., 5,181,948, Cl. 65-105.000.
Suzuki, Hiroyoshi, to Mitsubishi Denki Kabushiki Kaisha. Heater control device for an air-fuel ratio sensor. 5,182,519, Cl. 324-611.000.
Suzuki, Kenji: *See*—
Ishizaki, Akira; Suzuki, Kenji; Ohtaka, Keiji; and Suda, Yasuo, 5,182,658, Cl. 358-483.000.
Suzuki, Kiyotaka: *See*—
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Shuji; Nakajima, Ryoichi; and Naito, Sakae, 5,182,011, Cl. 208-39.000.
Suzuki, Masafumi: *See*—
Yoshioka, Osami; Matsui, Naoki; Sato, Hiroaki; Omori, Kouji; Yamazaki, Masayuki; Suzuki, Masafumi; Oishi, Hitoshi; Kitagawa, Naoto; Seike, Takaya; and Araki, Yasuhiro, 5,182,074, Cl. 266-87.000.
Suzuki, Masahiro; Nozaki, Kenji; Kajitani, Makoto; Yasumoto, Mitsugi; Ono, Naohiko; and Shindo, Takashi, to Taiho Pharmaceutical Co., Ltd. Piperazine compounds, processes for preparation thereof and medical uses thereof. 5,182,284, Cl. 514-255.000.
Suzuki, Masami: *See*—
Nakashima, Hisaharu; Hayasaki, Hiroyuki; Suzuki, Masami; Saito, Yoshinori; and Matuyama, Hisasi, 5,182,635, Cl. 358-12.000.
Suzuki, Masato; Inaba, Hiromi; Takenaga, Hiroshi; Yamazaki, Masachika; Oonuma, Naoto; Nakamura, Kiyoshi; Sakai, Yoshio; Yoneda, Kenji; Nakata, Naofumi; and Kasai, Syoji, to Hitachi, Ltd. Image processing apparatus having apparatus for correcting the image processing. 5,182,776, Cl. 382-14.000.
Suzuki, Masayoshi; and Akamatsu, Masuo, to Hitachi, Ltd. Hot wire air flow meter. 5,181,420, Cl. 73-204.150.
Suzuki, Michitaka: *See*—
Matsuda, Hiroshi; and Suzuki, Michitaka, 5,182,454, Cl. 250-310.000.
Suzuki, Nobutoshi: *See*—
Mimasu, Kazuo; Watanabe, Katsuhiko; and Suzuki, Nobutoshi, 5,182,691, Cl. 360-128.000.
Suzuki, Takashi: *See*—
Murai, Mikio; Takahashi, Kiyoshi; Odagiri, Masaru; Kai, Yoshiaki; Suzuki, Takashi; and Kunieda, Toshiaki, 5,182,132, Cl. 427-577.000.
Suzuki, Takeshi: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.
Suzuki, Toyoshi: *See*—
Hiraoka, Noriyoshi; and Suzuki, Toyoshi, 5,181,871, Cl. 440-77.000.
Suzuki, Yoshiki: *See*—
Makino, Yuji; Matugi, Hideo; and Suzuki, Yoshiki, 5,182,274, Cl. 514-167.000.
Svoboda, Vaclav, to Asea Brown Boveri Ltd. Water-cooled condenser. 5,181,559, Cl. 165-134.100.
Swanson, Vernon W.: *See*—
Wikstrom, Jan A.; Birrittella, Mark S.; Kiefer, David; Smetana, Stephen B.; and Swanson, Vernon W., 5,182,473, Cl. 307-454.000.
Swedima, Inc.: *See*—
Jonsson, Eston; and Waern, Roland, 5,182,099, Cl. 424-49.000.
Swei, Gwo, to Rogers Corporation. Coated particles and method for making same. 5,182,173, Cl. 428-391.000.
Swerts, Robert E. F.: *See*—
Schmidt, Bruce E.; and Swerts, Robert E. F., 5,182,035, Cl. 252-34.000.
SWF Auto-Electric: *See*—
Botz, Jakob; Hofmann, Georg; and Weber, Adam, 5,182,422, Cl. 200-61.540.
Botz, Jakob; Hofmann, Georg; and Weber, Adam, 5,182,423, Cl. 200-61.540.
Syka, John E. P.: *See*—
Schwartz, Jae C.; Syka, John E. P.; and Louris, John N., 5,182,451, Cl. 250-282.000.
Synek, Wenzel, to Fromm Holding AG. Banding apparatus. 5,181,546, Cl. 140-93.400.
System Technical Industries Co., Ltd.: *See*—
Kato, Katsuhisa, 5,182,145, Cl. 428-31.000.
Szablikowski, Klaus: *See*—
Breckwoldt, Jorn; and Szablikowski, Klaus, 5,182,380, Cl. 536-90.000.
T. Diamond Enterprises: *See*—
Todd, Harry V., 5,181,335, Cl. 40-607.000.
Tabasky, Marvin; Cataldo, Victor; Fitzgerald, Thomas W.; Chirravuri, Jagannath; Armiento, Craig A.; and Haugsjaa, Paul O., to GTE Laboratories Incorporated. Waferboard structure and method of fabricating. 5,182,782, Cl. 385-89.000.
Taccolini, Ray: *See*—
Linden, Tom H.; Passaglia, Dick; and Taccolini, Ray, 5,181,623, Cl. 211-183.000.
Tachibana, Yoji, to Nisshin Flour Milling Co., Ltd. 1-hydroxyvitamin D derivatives. 5,182,396, Cl. 552-653.000.
Tactical Fabs, Inc.: *See*—
Bechtel, Richard L.; Thomas, Mammen; and Hively, James W., 5,182,632, Cl. 257-713.000.
Taeschner, Wolfgang: *See*—
Brandhorst, Gerd; and Taeschner, Wolfgang, 5,181,918, Cl. 606-92.000.
Tagata, Tsutomu: *See*—
Komatsubara, Toshio; Tagata, Tsutomu; and Matsuo, Mamoru, 5,181,969, Cl. 148-552.000.
Taguchi, Kazuo; Onisawa, Kenichi; Fuyama, Moriaki; Tamura, Katsumi; Abe, Yoshio; Nakayama, Takahiro; Hashimoto, Kenichi; and Sato, Akira, to Hitachi, Ltd. Thin film electroluminescent device. 5,182,491, Cl. 313-503.000.
Tague, George E. Anti-tip device for wheelchair. 5,181,733, Cl. 280-304.000.
Tahara, Yoshiyuki: *See*—
Ogawa, Osamu; Kishi, Ikuo; Tahara, Yoshiyuki; and Sugita, Masanori, 5,182,267, Cl. 514-34.000.
Taiho Pharmaceutical Co., Ltd.: *See*—
Suzuki, Masahiro; Nozaki, Kenji; Kajitani, Makoto; Yasumoto, Mitsugi; Ono, Naohiko; and Shindo, Takashi, 5,182,284, Cl. 514-255.000.
Taiyo Kogyo Corporation: *See*—
Watanabe, Sumio; and Ishizu, Nobuhiko, 5,181,900, Cl. 493-210.000.
Taiyo Steel Co., Ltd.: *See*—
Aoyama, Yuji; and Kumai, Katsutoshi, 5,182,171, Cl. 428-623.000.
Takada, Shinzo: *See*—
Waki, Michio; and Takada, Shinzo, 5,182,756, Cl. 372-38.000.
Takada, Susumu: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.
Takafuji, Yutaka: *See*—
Shimada, Takayuki; Matsushima, Yasuhiro; and Takafuji, Yutaka, 5,182,620, Cl. 257-72.000.
Takagi, Kazo; Nakamura, Shigeoki; and Murayama, Chisei, to Daiki Engineering Co., Ltd. Stain preventing method. 5,182,007, Cl. 204-147.000.
Takahara, Yoshimasa: *See*—
Mishima, Ken; Mimura, Akio; Takahara, Yoshimasa; Asami, Kouji; and Hanai, Tetsuya, 5,182,193, Cl. 435-29.000.
Takahashi, Hideki, to Kabushiki Kaisha Kawai Gakki Seisakusho. Motif playing apparatus. 5,182,414, Cl. 84-634.000.
Takahashi, Hiroyuki: *See*—
Kawasaki, Masahiro; Takahashi, Hiroyuki; and Iwamoto, Shigeru, 5,182,591, Cl. 354-195.100.

Takahashi, Kazuyoshi: *See*—
Kobayashi, Takaichi; Shibasaki, Kazuka; Hosoi, Takashi; Honda, Masami; and Takahashi, Kazuyoshi, 5,182,698, Cl. 361-395.000.

Takahashi, Kiyoshi: *See*—
Murai, Mikio; Takahashi, Kiyoshi; Odagiri, Masaru; Kai, Yoshiaki; Suzuki, Takashi; and Kunieda, Toshiaki, 5,182,132, Cl. 427-577.000.

Takahashi, Mitsuhiko; Miyata, Hirofumi; Yuki, Shinya; Nonaka, Keizo; Nakano, Yoshihisa; Mitsuhashi, Hiroshi; Yamaguchi, Katsuya; and Yoshida, Yasuhiko, to Bando Chemical Industries, Inc. Belt driving system. 5,181,888, Cl. 474-101.000.

Takahashi, Osamu: *See*—
Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, 5,182,339, Cl. 525-242.000.

Takahashi, Takahiko: *See*—
Hongo, Mikio; Mizukoshi, Katsuro; Sano, Shyuzo; Kamimura, Takashi; and Takahashi, Takahiko, 5,182,231, Cl. 437-173.000.

Takahashi, Tomotsugu: *See*—
Yamauchi, Hiroshige; Ogasawara, Takashi; and Takahashi, Tomotsugu, 5,182,159, Cl. 428-192.000.

Takahashi, Toshikazu: *See*—
Kasuga, Kazuyuki; Hirose, Takuji; Takahashi, Toshikazu; and Hiratani, Kazuhisa, 5,182,398, Cl. 546-171.000.

Takahashi, Tsutomu; Oshita, Saiichiro; and Mouri, Toyohiko, to Fuji Jukogyo Kabushiki Kaisha. Motor control system for electric power steering apparatus. 5,182,711, Cl. 364-424.050.

Takahashi, Yuji: *See*—
Ueda, Noriyoshi; Takahashi, Yuji; and Kitahara, Makoto, 5,181,705, Cl. 271-3.000.

Takahira, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. Low power consumption non-contact integrated circuit card. 5,182,442, Cl. 235-492.000.

Takamatsu, Osamu: *See*—
Yanagisawa, Yoshihiro; Sakai, Kunihiro; Takamatsu, Osamu; Eguchi, Ken; Matsuda, Hiroshi; Kawade, Hisaaki; and Takeda, Toshihiko, 5,182,724, Cl. 365-151.000.

Takano, Masami: *See*—
Ashikawa, Noboru; Yaguchi, Bunsho; Yasuda, Toyoshi; Takano, Masami; Ohhashi, Akihito; Shimada, Hiroyuki; and Akioka, Masahiro, 5,181,893, Cl. 475-203.000.

Takano, Masayuki, to Sony Corporation. Program transmission system and method. 5,182,640, Cl. 358-86.000.

Takaoka, Kazuhito; Uehara, Masatoshi; and Sano, Yumiko, to Mita Industrial Co., Ltd. Electrophotographic image-forming method. 5,182,182, Cl. 430-124.000.

Takata, Hidehiro: *See*—
Tamura, Toshiyuki; Fujita, Masaki; Komori, Shinji; Sato, Hisakazu; and Takata, Hidehiro, 5,182,799, Cl. 395-400.000.

Takata, Koji: *See*—
Hashida, Koichi; and Takata, Koji, 5,181,534, Cl. 137-501.000.

Takata, Noboru; Arai, Junko; and Yorozu, Hidenori, to Kao Corporation. Bathing composition. 5,182,105, Cl. 424-78.020.

Takata, Souichi; Namba, Toyoaki; Okada, Kenji; and Wakuda, Osamu, to Sharp Kabushiki Kaisha. Top sheet feeding apparatus. 5,181,710, Cl. 271-98.000.

Takata, Souichi: *See*—
Yamamoto, Hiranaga; Takata, Souichi; Wakuda, Osamu; and Namba, Toyoaki, 5,181,706, Cl. 271-11.000.

Takeda Chemical Industries, Ltd.: *See*—
Nakahama, Kazuo; Kaisho, Yoshihiko; and Yoshimura, Koji, 5,182,195, Cl. 435-69.100.

Takeda, Hiroshi: *See*—
Taniguchi, Masato; Yagi, Juzo; and Takeda, Hiroshi, 5,181,691, Cl. 251-315.000.

Takeda, Toshihiko: *See*—
Yanagisawa, Yoshihiro; Sakai, Kunihiro; Takamatsu, Osamu; Eguchi, Ken; Matsuda, Hiroshi; Kawade, Hisaaki; and Takeda, Toshihiko, 5,182,724, Cl. 365-151.000.

Takedomi, Yasunari: *See*—
Mori, Hidetaka; Takedomi, Yasunari; and Morimoto, Takao, 5,181,603, Cl. 200-302.100.

Takei, Hajime; Yamakoshi, Yukiyoshi; Matsuda, Naoyuki; Moro, Fuminori; Tomita, Hiroshi; and Sano, Homare, to Minolta Camera Kabushiki Kaisha. Sheet handling apparatus provided with a sheet sucking unit. 5,181,707, Cl. 271-20.000.

Takei, Kiyoshi: *See*—
Chikuma, Kiyofumi; and Takei, Kiyoshi, 5,182,669, Cl. 359-241.000.

Takekoshi, Tomoaki, to Fuji Photo Film Co., Ltd. Automatic dampening water replenisher. 5,181,467, Cl. 101-147.000.

Takemoto, Shoji: *See*—
Ikeda, Hayato; Fujii, Toshiro; Yokomachi, Naoya; and Takemoto, Shoji, 5,181,834, Cl. 417-269.000.

Takemura, Yoshinobu: *See*—
Fukunaga, Yasuyuki; Kita, Hideki; Nakakuma, Akira; Taniguchi, Toru; Fukui, Hidehiro; and Takemura, Yoshinobu, 5,182,584, Cl. 346-157.000.

Takenaga, Hiroshi: *See*—
Suzuki, Masato; Inaba, Hiromi; Takenaga, Hiroshi; Yamazaki, Masachika; Oonuma, Naoto; Nakamura, Kiyoshi; Sakai, Yoshio; Yoneda, Kenji; Nakata, Naofumi; and Kasai, Syoji, 5,182,776, Cl. 382-14.000.

Takenaka, Kenji: *See*—
Kayukawa, Hiroaki; Kimura, Kazuya; Takenaka, Kenji; and Okuno, Takuya, 5,181,453. Cl. 92-12.200.

Taketsugu, Hiroshi: *See*—
Shia, Yoshiaki; Mori, Hideaki; Kida, Otojiro; and Taketsugu, Hiroshi, 5,181,779, Cl. 374-139.000.

Takeuchi, Kunihiro: *See*—
Okano, Masami; and Takeuchi, Kunihiro, 5,182,459, Cl. 307-10.100.

Takeyama, Takahiro: *See*—
Hagi, Norio; and Takeyama, Takahiro, 5,182,329, Cl. 525-242.000.

Takiguchi, Eiji: *See*—
Iwafune, Seiichiro; Yamaguchi, Kojiro; Takiguchi, Eiji; and Iwata, Toshiro, 5,181,976, Cl. 152-209.00R.

Takiguchi, Haruhisa: *See*—
Taneya, Mototaka; Konushi, Fumihiro; Okumura, Toshiyuki; and Takiguchi, Haruhisa, 5,182,758, Cl. 372-46.000.

Takizawa, Toshiaki: *See*—
Horita, Yoshiyuki; Ishii, Susumu; and Takizawa, Toshiaki, 5,181,298, Cl. 24-429.000.

Takuma, Keisuke; Ohyama, Tsukasa; Igata, Akitoshi; Mikoda, Tamio; Ghoda, Isamu; and Koshida, Hitoshi, to Mitsui Toatsu Chemicals, Inc. Isopropyl 1-amino-4-m-toluidinoanthraquinone-2-carboxylate. 5,182,395, Cl. 552-251.000.

Takuma, Keisuke; Irizato, Yoshihiro; and Katho, Kimitoshi, to Mitsui Toatsu Chemicals Inc. Preparation process of bis(1,2-diaryl-1,2-ethyolenedithiolato)nickel-based complex. 5,182,409, Cl. 556-146.000.

Talbert Ltd.: *See*—
Masel, Ruben; and Valdshtein, George, 5,181,455, Cl. 99-391.000.

Taliani, Laurent: *See*—
Benoit, Marc; Brayer, Jean-Louis; Demoute, Jean-Pierre; Mourioux, Gilles; and Taliani, Laurent, 5,182,295, Cl. 514-365.000.

Talley, James C., to United States of America, Navy. Aimable warhead. 5,182,418, Cl. 102-475.000.

Tallibert, Patrick: *See*—
Luciani, Pierre; Deves, Philippe; and Tallibert, Patrick, 5,182,717, Cl. 364-481.000.

Tam, James P., to Rockefeller University, The. Modified transforming growth factor alpha oligopeptides and pharmaceutical compositions thereof. 5,182,261, Cl. 514-12.000.

Tamamura, Hideo, to Canon Kabushiki Kaisha. Camera using film with magnetic recording portion having film feeding motor positioned to minimize the effect of noise therefrom. 5,182,589, Cl. 354-105.000.

Tamko Asphalt Products, Inc.: *See*—
Mitchell, Grant D., 5,182,319, Cl. 524-68.000.

Tamura, Katsumi: *See*—
Taguchi, Kazuo; Onisawa, Kenichi; Fuyama, Moriaki; Tamura, Katsumi; Abe, Yoshio; Nakayama, Takahiro; Hashimoto, Kenichi; and Sato, Akira, 5,182,491, Cl. 313-503.000.

Tamura, Makoto: *See*—
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Shuji; Nakajima, Ryoichi; and Naito, Sakae, 5,182,011, Cl. 208-39.000.

Tamura, Shinichi; Kurata, Takeshi; Aizawa, Chikara; and Nagamine, Takashi, to National Institute of Health; and Kitasato Institute, The. Vaccine preparation comprising a bacterial toxin adjuvant. 5,182,109, Cl. 424-92.000.

Tamura, Toshiyuki; Fujita, Masaki; Komori, Shinji; Sato, Hisakazu; and Takata, Hidehiro, to Mitsubishi Denki Kabushiki Kaisha. Retrieving data using hash memory address generated by reversing /xor bits of selected bit strings of an input packet id. 5,182,799, Cl. 395-400.000.

Tan, Siv-Cheng: *See*—
Touboul, Pierre-Jean; and Tan, Siv-Cheng, 5,181,513, Cl. 128-660.070.

Tanabe, Hiroto; and Yamazaki, Kazumasa, to Nippon Steel Corporation. Automobile body reinforcing steel pipe. 5,181,974, Cl. 148-320.000.

Tanabe Seiyake Co., Ltd.: *See*—
Iwasaki, Tameo; Kondo, Kazuhiko; Matsuoka, Yuzo; Matsumoto, Mamoru; and Sugiura, Masaki, 5,182,404, Cl. 548-237.000.

Tanabe Seiyaky Co., Ltd.: *See*—
Nakai, Hideo; Yamada, Koichiro; Nomura, Shumihiro; Matsumoto, Mamoru; and Iwata, Hiroshi, 5,182,296, Cl. 514-376.000.

Tanaka, Junichiro: *See*—
Matsuzawa, Shigeji; Yuasa, Eiji; Tanaka, Junichiro; and Nakamura, Teruo, 5,182,138, Cl. 427-157.000.

Tanaka, Kazuhiro, to Fujitsu Limited. Optical bandpass filter having a variable passband wavelength. 5,182,788, Cl. 385-131.000.

Tanaka Kikinzoku Kogyo K.K.: *See*—
Furuya, Nagakazu, 5,181,993, Cl. 204-86.000.
Yamasaki, Haruki, 5,181,526, Cl. 128-784.000.

Tanaka, Nobuhiro; Tawara, Hirotoshi; and Hirata, Eiji, to KAO Corporation. Method for shifting goods and apparatus therefor. 5,181,818, Cl. 414-414.000.

Tanaka, Osamu, to Rohm Co., Ltd. Back-light type liquid crystal display. 5,182,660, Cl. 359-49.000.

Tanaka, Tetsukazu; Imai, Masahiro; Ikeda, Hiroshi; and Makino, Yosiyuki, to Kabushiki Kaisha Toshiba. Dehydrator. 5,181,398, Cl. 68-12.060.

Tanaka, Toshihiro: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Tanaka, Yasutaka: *See*—
Fuchikami, Takamasa; Ubukata, Yumiko; and Tanaka, Yasutaka, 5,182,246, Cl. 502-161.000.

Taneya, Mototaka; Konushi, Fumihiro; Okumura, Toshiyuki; and Takiguchi, Haruhisa, to Sharp Kabushiki Kaisha. Periodic gain-type semiconductor laser device. 5,182,758, Cl. 372-46.000.

Tani, Kensuke; and Tonomura, Yoshiaki, to 501 Nippon Polyurethane Industry Co., Ltd. Flexible polyurethane foams and process for producing same. 5,182,314, Cl. 521-160.000.

Tanigawa, Hiroshi; Kondo, Hiroshi; Fukai, Isao; and Tohyama, Tsuneo, to Toko, Inc. Polar leapfrog filter. 5,182,522, Cl. 328-167.000.

Taniguchi, Hitofumi: *See*—
Hirokawa, Kiyofumi; and Taniguchi, Hitofumi, 5,182,239, Cl. 501-98.000.

Taniguchi, Masato; Yagi, Juzo; and Takeda, Hiroshi, to NGK Spark Plug Co., Ltd. Mechanical part made of ceramics. 5,181,691, Cl. 251-315.000.

Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, to Canon Kabushiki Kaisha. Liquid crystal apparatus. 5,182,549, Cl. 340-784.000.

Taniguchi, Toru: *See*—
Fukunaga, Yasuyuki; Kita, Hideki; Nakakuma, Akira; Taniguchi, Toru; Fukui, Hidehiro; and Takemura, Yoshinobu, 5,182,584, Cl. 346-157.000.

Tanisake, Hiroka; Koyama, Takeshi; and Isozaki, Tsuyoshi, to Mitsubishi Gas Chemical Company, Inc. Process for producing bistrimellitic imide. 5,182,392, Cl. 548-520.000.

Tanishima, Masami: *See*—
Sato, Masamitsu; and Tanishima, Masami, 5,181,516, Cl. 128-673.000.

Tannenbaum, David C.: *See*—
Liang, Bob C.-C.; Liang, Nina Y.; Phelps, Michael J.; and Tannenbaum, David C., 5,182,797, Cl. 395-160.000.

Tanttu, Pekka; and Valkeinen, Osmo E. O., to Elopak Systems AG. Packaging. 5,181,652, Cl. 229-243.000.

Tanuku, Sarma S.: *See*—
Askew, James D.; Chao, Chin-Wang; Cochran, David R.; Dollard, Peter M.; Eslambolchi, Hossein; Goodson, William E.; Guenther, Robert P.; Mansour, Omar M.; Nguyen, Liem T.; and Tanuku, Sarma S., 5,182,744, Cl. 370-16.000.

Tarbet, Bryon J.: *See*—
Bruening, Ronald L.; Tarbet, Bryon J.; Bradshaw, Jerald S.; Izatt, Reed M.; and Krakowiak, Krzysztof E., 5,182,251, Cl. 502-401.000.

Tardiff, Albert N., Jr.; and Grove, Corey M., to United States of America, Army. Multilayer protective gas mask. 5,181,506, Cl. 128-201.220.

Target Products, Inc.: *See*—
Roemmele, Carl F.; and Meister, Donald F., 5,181,348, Cl. 51-410.000.

Tarnoff, Harry L.: *See*—
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.

Tateishi, Fumikazu: *See*—
Kayashima, Kazuhiro; Tateishi, Fumikazu; and Ohshima, Kiyoko, 5,182,790, Cl. 385-141.000.

Tatsumi, Hiroki: *See*—
Kajiyama, Naoki; Masuda, Tsutomu; Tatsumi, Hiroki; and Nakano, Eiichi, 5,182,202, Cl. 435-189.000.

Tatsumi, Masayuki: *See*—
Igarashi, Toshio; Shinohara, Sueharu; Tatsumi, Masayuki; Hikasa, Tadashi; and Mendori, Hiroaki, 5,182,167, Cl. 428-318.600.

Taus, Christian: *See*—
Rau, Willy; Rau, Wolfgang; and Taus, Christian, 5,181,476, Cl. 111-60.000.

Tawara, Hirotoshi: *See*—
Tanaka, Nobuhiro; Tawara, Hirotoshi; and Hirata, Eiji, 5,181,818, Cl. 414-414.000.

Taylor, Robert L., Jr.: *See*—
Honeycutt, Travis W.; and Taylor, Robert L., Jr., 5,181,966, Cl. 134-42.000.

Taylor, Russell G.: *See*—
Theys, Ezra; Taylor, Russell G.; Bertelsen, Bruce; Oey, Albert; Hoyrup, John; and Knafelc, Frank, 5,181,456, Cl. 99-485.000.

Taylor, Stewart S.; McCormack, Gary D.; Davenport, William H.; and Hamilton, Patrick J., to TriQuint Semiconductor, Inc. High performance multiplexer for improving bit error rate. 5,182,467, Cl. 307-243.000.

Tazi, Mohammed: *See*—
Kopolow, Stephen L.; Tazi, Mohammed; and Walls, Edward W., Jr., 5,182,098, Cl. 424-47.000.

TDK Corporation: *See*—
Hirose, Kazunori; Hashimoto, Shinya; and Yajima, Koichi, 5,181,973, Cl. 148-302.000.
Koga, Keiji; Satoh, Jun-ichi; Yokoyama, Kenji; Nisizawa, Akinori; and Tokuoka, Yasumichi, 5,182,693, Cl. 360-135.000.

Teal, Richard D.: *See*—
Hutchison, Wayne R.; Patterson, Jon M.; Hardesty, Terry D.; Teal, Richard D.; Hayes, Eugene G.; Coffey, Michael J.; and Moore, Earl T., 5,181,688, Cl. 248-680.000.

Techmatics, Inc.: *See*—
Woodworth, George K.; and Smith, Forrest K., 5,182,464, Cl. 307-87.000.

Teijin Limited: *See*—
Fukuda, Masayuki; and Miura, Sadayoshi, 5,182,169, Cl. 428-343.000.
Makino, Yuji; Matugi, Hideo; and Suzuki, Yoshiki, 5,182,274, Cl. 514-167.000.

Telectronics Pacing Systems, Inc.: *See*—
Nickolls, Peter; Lu, Richard M. T.; Collins, Kenneth A.; McCulloch, Roy M.; Cheatle, Lucy M.; and Cleland, Brian, 5,181,511, Cl. 128-419.0PG.

Telefonaktiebolaget L M Ericsson: *See*—
Dahlin, Jan E. A. S.; and Raith, Krister A., 5,182,753, Cl. 371-43.000.

Telex Communications, Inc.: *See*—
Bourk, Terrance R., 5,182,774, Cl. 381-71.000.

Tepfer, David A.: *See*—
Slightom, Jerry L.; and Tepfer, David A., 5,182,200, Cl. 435-172.300.

Tepper, John C.: *See*—
Erickson, John H.; and Tepper, John C., 5,181,902, Cl. 600-13.000.

Terada, Masahiro: *See*—
Taniguchi, Osamu; Inoue, Hiroshi; Mizutome, Atsushi; Mihara, Tadashi; Onitsuka, Yoshihiro; and Terada, Masahiro, 5,182,549, Cl. 340-784.000.

Terashima, Shigeo: *See*—
Maeda, Shigemi; Deguchi, Toshihisa; and Terashima, Shigeo, 5,182,741, Cl. 369-50.000.

Terawaki, Ritsuko: *See*—
Izumi, Masahiro; Aoshima, Toshiharu; Ide, Yutaka; Terawaki, Ritsuko; and Hosoya, Hideaki, 5,181,491, Cl. 123-336.000.

Teraya, Takanori, to Zexel Corporation. Variable capacity wobble plate compressor. 5,181,831, Cl. 417-222.00S.

Termini, Roberta: *See*—
Bruzzese, Tiberio; Signorini, Massimo; Fanciano, Carlo A.; and Termini, Roberta, 5,182,265, Cl. 514-18.000.

Terpstra, Daniel A., to Emerson Electric Co. Miter saw apparatus with adjustable workpiece supporting fence. 5,181,448, Cl. 83-468.300.

Terzian, Berj A., to Equitime, Inc. Readily settable balanced digital time displays. 5,182,733, Cl. 368-82.000.

Teunissen, Jeremias. Apparatus and process for grinding a profile of a band saw. 5,181,343, Cl. 51-135.00R.

Teutsch, Jean G.: *See*—
Philibert, Daniel; Teutsch, Jean G.; Costerousse, Germain; and Deraedt, Roger, 5,182,381, Cl. 540-4.000.

Tew, Claude E., to Texas Instruments Incorporated. Circuit with reset noise cancellation. 5,182,446, Cl. 250-208.100.

Texaco Chemical Company: *See*—
Duranleau, Roger G.; Plishka, Martin J.; and Cuscurida, Michael, 5,182,025, Cl. 210-681.000.

Texaco Inc.: *See*—
Benfarmeo, Nicholas; and Nalesnik, Theodore E., 5,182,041, Cl. 252-51.50A.
Kuhlmann, Erven J.; Pascoe, James R.; Browne, James E.; and Martin, Kevin J., 5,182,247, Cl. 502-217.000.
Najjar, Mitri S.; and Hultman, Carl A., 5,181,941, Cl. 55-16.000.
Pasternak, Mordechai; and Reale, John, Jr., 5,182,022, Cl. 210-638.000.
Shirodkar, Shailaja M.; and Speranza, George P., 5,182,038, Cl. 252-51.50A.

Texas Instruments Incorporated: *See*—
Alexander, Rhonda L.; Irrgang, Michael E.; and Kirchner, John A., 5,182,793, Cl. 395-13.000.
Boutaud, Frederic; and Chauvel, Gerard, 5,182,795, Cl. 395-142.000.
Farley, Joseph D.; and Fattori, Frank, 5,182,469, Cl. 307-296.200.
Hynecek, Jaroslav, 5,182,623, Cl. 257-230.000.
Malhi, Satwinder; and Efland, Taylor R., 5,182,222, Cl. 437-41.000.
Ovens, Kevin M.; and Niehaus, Jeffrey A., 5,182,223, Cl. 437-60.000.
Rice, Joseph A., Jr., 5,182,514, Cl. 324-244.000.
Schreck, John F.; and Truong, Phat C., 5,182,726, Cl. 365-203.000.
Shiwaku, Noboru, 5,182,560, Cl. 341-158.000.
Tew, Claude E., 5,182,446, Cl. 250-208.100.

Texas Romec, Inc.: *See*—
O'Connor, Rodney J.; and O'Connor, Mark A., 5,182,023, Cl. 210-652.000.

Textron Inc.: *See*—
Hayek, James S., 5,181,372, Cl. 56-17.400.

Tezuka, Kouichi: *See*—
Nagamune, Akio; Tezuka, Kouichi; Komine, Isamu; Kuriyama, Shinji; Komatani, Masaki; and Inoue, Akihiko, 5,182,565, Cl. 342-124.000.

Theising, John L., to Emerson Electric Co. Self-aligning quick pick-off rip fence. 5,181,446, Cl. 83-438.000.

Thelen, Ulrich; and Hirth, Thomas, to Daimler-Benz AG. Method for detecting the motion and position state of a component of an inductive electric load, which component can be moved between two end positions by means of magnetic interaction. 5,182,517, Cl. 324-418.000.

Thengs, Norvald; and Olsen, John D. Oil collector. 5,181,802, Cl. 405-70.000.

THERA Patent GmbH & Co. KG Gesellschaft Fuer industrielle Schutzrechte: *See*—
Brandhorst, Gerd; and Taeschner, Wolfgang, 5,181,918, Cl. 606-92.000.

Theriault, F. Michael: *See*—
Grosswiller, Leo J.; Theriault, F. Michael; Mannella, Lawrence F.; and Anders, Walter G., 5,181,805, Cl. 406-189.000.
Grosswiller, Leo J.; Theriault, F. Michael; Mannella, Lawrence F.; and Anders, Walter G., 5,181,806, Cl. 406-189.000.

Thermo King Corporation: *See*—
Hanson, Jay L.; and Jurewicz, Romuald M., 5,181,389, Cl. 62-126.000.

Theus, Ulrich, to Deutsche ITT Industries GmbH. CMOS transconductance amplifier with floating operating point. 5,182,525, Cl. 330-253.000.

Theys, Ezra; Taylor, Russell G.; Bertelsen, Bruce; Oey, Albert; Hoyrup, John; and Knafelc, Frank, to Clorox Company, The. Apparatus for forming binderless edible products. 5,181,456, Cl. 99-485.000.

Thieler, Stephen M.: *See*—
Bales, Bruce M.; Crumpley, Robert L.; North, Sandra S.; and Thieler, Stephen M., 5,182,750, Cl. 370-110.100.
Bales, Bruce M.; Crumpley, Robert L.; North, Sandra S.; and Thieler, Stephen M., 5,182,751, Cl. 370-110.100.

Thom, Richard A.: *See*—
Bishop, Thomas R.; Thom, Richard A.; and Breveglieri, Frank L., 5,181,605, Cl. 206-37.100.

Thomas Broadbent & Sons Limited: *See*—
Grimwood, Geoffrey L., 5,182,020, Cl. 210-512.100.

Thomas, Howard C., to Eureka Acquisition Corp. Variable width and length holding and size sensing device for a dual axis translation mechanism. 5,181,824, Cl. 414-751.000.

Thomas, Mammen: *See*—
Bechtel, Richard L.; Thomas, Mammen; and Hively, James W., 5,182,632, Cl. 257-713.000.

Thomas Regout N.V.: *See*—
Wojcik, Hendricus T., 5,181,781, Cl. 384-21.000.
Wojcik, Thadeus H., 5,181,782, Cl. 384-21.000.

Thomas, Vincent P.; and Baker, Peter, to International Business Machines Corporation. Estimator positioning system and method. 5,182,684, Cl. 360-78.090.

Thomasino, Robert F.: *See*—
Woods, James L.; and Thomasino, Robert F., 5,181,814, Cl. 410-122.000.

Thompson International, Inc.: *See*—
Hudgins, Richard D.; Sounart, Lawrence R.; and Storck, Alan G., 5,181,767, Cl. 301-37.370.

Thompson, Martin, to Schlumberger Technology Corporation. Sampling of drilling mud. 5,181,419, Cl. 73-153.000.

Thompson, Mortimer S., to Innovative Closures, Inc. Plastic closures for containers and cans and methods of and apparatus for producing such closures. 5,181,615, Cl. 220-618.000.

Thompson, Stephen A.: *See*—
Kidd, Thomas F.; and Thompson, Stephen A., 5,181,551, Cl. 164-113.000.

Thomson Consumer Electronics, Inc.: *See*—
Keenan, Douglas M., 5,182,646, Cl. 358-193.100.

Thomson-CSF: *See*—
Lehureau, Jean-Claude; and Neubert, Sophie, 5,182,781, Cl. 385-33.000.
Tinet, Claude, 5,182,743, Cl. 369-275.400.

Thorn EMI plc: *See*—
Holden, John G.; and Shanks, Ian A., 5,182,490, Cl. 313-485.000.

Those Characters From Cleveland: *See*—
Perkitny, Jerzy, 5,181,877, Cl. 446-337.000.

3-D Structures, Inc.: *See*—
Skolnick, Leonard P.; and Clinton, Joseph D., 5,181,355, Cl. 52-80.000.

Thuis, Robbert C., to U.S. Philips Corporation. Transformer with twisted conductors. 5,182,537, Cl. 336-180.000.

Thurin, Magdalena: *See*—
Steplewski, Zenon; Koprowski, Hilary; and Thurin, Magdalena, 5,182,192, Cl. 435-7.230.

Thurman, Dan L.; Slane, Melvin B.; Berndt, Charles F.; and Olszewski, John A., to Caterpillar Inc. Method for producing steel alloy gears. 5,181,375, Cl. 51-287.000.

Thyssen Industries AG Maschinenbau: *See*—
Jack, Kurt K. J.; and Alber, Gerhard G. A., 5,182,428, Cl. 219-121.630.

Tiers, George V. D.: *See*—
DeVoe, Robert J.; Brown-Wensley, Katherine A.; and Tiers, George V. D., 5,182,316, Cl. 522-99.000.

Tietze, Walter; and Badstuebner, Hella, to Otis Elevator Company. Roller supporting assembly for escalator or moving walkway handrail newels. 5,181,595, Cl. 198-335.000.

Tiller, John R., Jr.: *See*—
Abraham, Robert L.; Moore, Richard E.; Rich, William L.; Shackelford, Floyd W.; Tiller, John R., Jr.; and Briggs, Richard S., Jr., 5,182,804, Cl. 395-600.000.

Tilley, Jefferson W.: *See*—
Danho, Waleed; Tilley, Jefferson W.; Triscari, Joseph; and Wagner, Rolf, 5,182,263, Cl. 514-16.000.

Tinet, Claude, to Thomson-CSF. Optical disk arrangement with diffractive tracks allowing positional control. 5,182,743, Cl. 369-275.400.

Ting, Pauline C.; Sherlock, Margaret H.; Tom, Wing C.; and Kaminski, James J., to Schering Corporation. Heterobicyclic compounds having antiinflammatory activity. 5,182,289, Cl. 514-278.000.

Ting, Yi: *See*—
Manos, M. Michele; Wright, Deann K.; and Ting, Yi, 5,182,377, Cl. 536-24.320.

Tite, Robert C.: *See*—
Monthony, James F.; Livingston, Dwight; Reuben, Jayakumar; and Tite, Robert C., 5,182,082, Cl. 422-57.000.

Tobkes, Martin; Diaz, Simon; and Krishnan, Lalitha, to American Cyanamid Company. Clindamycin phosphate synthesis. 5,182,374, Cl. 536-16.500.

Tochihara, Shinichi: *See*—
Haruta, Masahiro; Ikeda, Masami; Karita, Seiichiro; Kuwabara, Nobuyuki; Kawamura, Takahisa; Higuma, Masahiko; Arashima, Teruo; Abe, Tsutomu; Nishiwaki, Osamu; Tochihara, Shinichi; Nagashima, Akira; Aoki, Makoto; and Mafune, Kumiko, 5,182,579, Cl. 346-140.00R.

Todd, Harry V., to T. Diamond Enterprises. Portable sign installation kit and method of using same. 5,181,335, Cl. 40-607.000.

Togawa Rubber Co., Ltd.: *See*—
Tsuji, Toshinori; Hosoya, Koichi; Tsukimoto, Fumio; Ashida, Tatsuya; Okubo, Katsuyuki; Bokuhara, Tetsuo; and Shinzo, Toshiaki, 5,181,668, Cl. 242-54.00R.

Toge, Yoshiyuki: *See*—
Yoneyama, Yoshito; Toge, Yoshiyuki; and Yuguchi, Naoki, 5,182,617, Cl. 356-440.000.

Tohyama, Tsuneo: *See*—
Tanigawa, Hiroshi; Kondo, Hiroshi; Fukai, Isao; and Tohyama, Tsuneo, 5,182,522, Cl. 328-167.000.

Toinen, Christian: *See*—
Bosc, Dominique; Guilbert, Martine; and Toinen, Christian, 5,182,783, Cl. 385-123.000.

Tokai Rubber Industries, Ltd.: *See*—
Kitamura, Hirokazu, 5,181,751, Cl. 285-39.000.

Tokiway Chemical Industries, Co., Ltd.: *See*—
Kato, Katsuhisa, 5,182,145, Cl. 428-31.000.

Toko, Inc.: *See*—
Tanigawa, Hiroshi; Kondo, Hiroshi; Fukai, Isao; and Tohyama, Tsuneo, 5,182,522, Cl. 328-167.000.

Tokunaga, Wataru: *See*—
Iwai, Noriyuki; Sasaki, Kimito; Yano, Masaru; Wakimoto, Fumiyoshi; Tokunaga, Wataru; and Shirakura, Masaru, 5,182,676, Cl. 359-841.000.

Tokuoka, Yasumichi: *See*—
Koga, Keiji; Satoh, Jun-ichi; Yokoyama, Kenji; Nisizawa, Akinori; and Tokuoka, Yasumichi, 5,182,693, Cl. 360-135.000.

Tokuyama Soda Kabushiki Kaisha: *See*—
Hirokawa, Kiyofumi; and Taniguchi, Hitofumi, 5,182,239, Cl. 501-98.000.

Tokuyama, Takashi, to Alpine Electronics, Inc. Digital-analog converter with plural coefficient transversal filter. 5,182,559, Cl. 341-144.000.

Tokyo Electric Co., Ltd.: *See*—
Ono, Yoshiaki, 5,181,466, Cl. 101-142.000.

Tokyo Electron Sagami Limited: *See*—
Sakata, Kazunari; Ishii, Katsumi; and Yamaga, Kenichi, 5,181,819, Cl. 414-217.000.

Tolbert, James H. Water sport footware. 5,181,873, Cl. 441-65.000.

Tom, Wing C.: *See*—
Ting, Pauline C.; Sherlock, Margaret H.; Tom, Wing C.; and Kaminski, James J., 5,182,289, Cl. 514-278.000.

Tomecanic: *See*—
Pourtau, Jean-Jacques; and Pourtau, Thierry E., 5,181,357, Cl. 52-179.000.

Tomei Sangyo Co., Ltd.: *See*—
Ohta, Kiyohiko; Kamiya, Kaoru; Watanabe, Keiko; Nakagawa, Makoto; and Nagao, Tomio, 5,181,604, Cl. 206-5.100.

Tomimuro, Hisashi; Ishitsuka, Fuminori; Sato, Nobuo; and Osaki, Takaaki, to Nippon Telegraph and Telephone Corporation. Film carrier for RF IC. 5,182,631, Cl. 257-664.000.

Tomisawa, Naoki, to Japan Electronic Control Systems Co. Ltd. Driving condition recognition system for an automotive vehicle and shift control system for an automotive automatic power transmission utilizing the results of vehicular driving state recognition. 5,182,710, Cl. 364-424.100.

Tomita, Hiroshi: *See*—
Takei, Hajime; Yamakoshi, Yukiyoshi; Matsuda, Naoyuki; Moro, Fuminori; Tomita, Hiroshi; and Sano, Homare, 5,181,707, Cl. 271-20.000.

Tomita, Rokuro: *See*—
Umaki, Yasuhide; Tomita, Rokuro; Hondo, Fumiaki; and Okada, Shigeru, 5,181,961, Cl. 106-724.000.

Tomiyasu, Hiroshi; Kobayashi, Yoshiko; Goto, Kiyoshi; Yamamoto, Takeshi; and Nakai, Hideyuki, to Mitsubishi Kasei Corporation; and Konica Corporation. Positive photosensitive planographic printing plates containing specific high-molecular weight compound and photosensitive ester of O-napthoquinonediazidosulfonic acid with polyhydroxybenzophenone. 5,182,183, Cl. 430-165.000.

Tomley, Fiona M.: *See*—
Binns, Matthew M.; Boursnell, Michael E. G.; Campbell, Joan I. A.; and Tomley, Fiona M., 5,182,210, Cl. 435-320.100.

Tong, Yit C.: *See*—
Chang, Joseph S.; and Tong, Yit C., 5,182,521, Cl. 328-167.000.

Tonomura, Yoshiaki: *See*—
Tani, Kensuke; and Tonomura, Yoshiaki, 5,182,314, Cl. 521-160.000.

Torii, Keiichiro: *See*—
Miyashita, Akimi; Fujii, Mutsumasa; Kubosawa, Minoru; Torii, Keiichiro; Ooki, Nobuaki; Kogawa, Kiyonori; Kawaguchi, Masami; Murooka, Hideyasu; and Kyooi, Masayuki, 5,182,121, Cl. 425-338.000.

Torikata, Yasuo: *See*—
Kageyama, Minoru; and Torikata, Yasuo, 5,182,124, Cl. 426-19.000.

Torrington Company, The: *See*—
Seifert, Keith L.; and Furst, Robert E., 5,182,070, Cl. 264-241.000.
Toshiba Lighting & Technology Corporation: *See*—
Itoh, Akira; Okamura, Kazuyoshi; and Uchida, Kazuiki, 5,182,486, Cl. 313-25.000.
Toshiba Machine Co., Ltd.: *See*—
Ozawa, Koichi; Abe, Hajime; and Owashi, Yutaka, 5,182,117, Cl. 425-144.000.
Toshiyuki, Iizuka. Seed peeling apparatus. 5,181,457, Cl. 99-514.000.
Tosoh Corporation: *See*—
Hagi, Norio; and Takeyama, Takahiro, 5,182,329, Cl. 525-242.000.
Touboul, Pierre-Jean; and Tan, Siv-Cheng, to Touboul, Pierre-Jean; and Traitement Synthese Image. Method of acquiring ultrasound images. 5,181,513, Cl. 128-660.070.
Toyama, Tsuyoshi: *See*—
Andoh, Nobuaki; Kohda, Kenji; Toyama, Tsuyoshi; Noguchi, Kenji; and Kobayashi, Shinichi, 5,182,725, Cl. 365-185.000.
Toyoda, Shinji: *See*—
Jutamulia, Suganda; Fujita, Akihiro; Toyoda, Shinji; Kojima, Atsushi; and Ito, Eiichi, 5,182,639, Cl. 358-81.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kayanuma, Nobuaki, 5,181,499, Cl. 123-690.000.
Traitement Synthese Image: *See*—
Touboul, Pierre-Jean; and Tan, Siv-Cheng, 5,181,513, Cl. 128-660.070.
Tran, Nang T.; Loeding, Neil W.; and Nins, David V., to Minnesota Mining and Manufacturing Company. Solid state electromagnetic radiation detector FET array. 5,182,624, Cl. 257-40.000.
Treat, Theodore A.: *See*—
Feiring, Andrew E.; Krespan, Carl G.; Resnick, Paul R.; Smart, Bruce E.; Treat, Theodore A.; and Wheland, Robert C., 5,182,342, Cl. 526-206.000.
Tremaine, Brian P.: *See*—
Krause, James N.; Tremaine, Brian P.; and Chan, Litko R., 5,182,685, Cl. 360-78.130.
Tri-Mark Metal Corporation: *See*—
Krueger, Robert A.; and Krueger, Michael K., 5,181,354, Cl. 52-79.100.
Tri-O-Clean Laundry Systems, Inc.: *See*—
Engel, Richard B.; Gallo, John B.; Bladen, Donald H.; and Engel, Virginia F., 5,181,399, Cl. 68-13.00R.
Tridon Limited: *See*—
Kovalsky, Lev, 5,181,426, Cl. 73-862.541.
TriQuint Semiconductor, Inc.: *See*—
Taylor, Stewart S.; McCormack, Gary D.; Davenport, William H.; and Hamilton, Patrick J., 5,182,467, Cl. 307-243.000.
Triscari, Joseph: *See*—
Danho, Waleed; Tilley, Jefferson W.; Triscari, Joseph; and Wagner, Rolf, 5,182,263, Cl. 514-16.000.
Truong, Phat C.: *See*—
Schreck, John F.; and Truong, Phat C., 5,182,726, Cl. 365-203.000.
TRW Inc.: *See*—
Engler, Leonard W., 5,181,581, Cl. 180-148.000.
Foreman, Kevin G.; and Miller, Paul J., 5,181,859, Cl. 439-225.000.
Gilliem, Donald L., 5,181,579, Cl. 180-6.480.
TRW Vehicle Safety Systems Inc.: *See*—
Bauer, Barney; Blackburn, Brian K.; and Gentry, Scott B., 5,181,739, Cl. 280-807.000.
Lenzen, Reiner; Faigle, Ernst M.; and Semchena, John H., 5,181,737, Cl. 280-732.000.
Tsai, Song-Jau: *See*—
Yeh, Tse-Huei; Tsai, Song-Jau; Lin, Chang-Tsun; Liao, Long-Gee; and Huang, Tsai-Sheng, 5,181,408, Cl. 72-11.000.
Tsang, Irving C.: *See*—
Karafian, Maxim; and Tsang, Irving C., 5,181,937, Cl. 48-95.000.
Tseng, Everette. Lamp shade. 5,181,776, Cl. 362-351.000.
Tsubaki, Masayuki: *See*—
Noda, Touru; Tsubaki, Masayuki; Sakai, Yasunosuke; Ashida, Tetsuya; and Matsuda, Hiroshi, 5,182,161, Cl. 428-195.000.
Tsubakimoto Chain Co.: *See*—
Maruyama, Masao; Kozakura, Nobuto; and Nakakubo, Katsuya, 5,181,889, Cl. 474-110.000.
Tsuboi, Toshio; Moriya, Shigeru; and Nakatani, Keiji, to Minolta Camera Kabushiki Kaisha. Digital color copying machine comprising a test mode for making a color adjustment. 5,182,638, Cl. 358-80.000.
Tsuchinaga, Masamitsu: *See*—
Ueda, Masanori; Tsuchinaga, Masamitsu; Iura, Teruo; and Fujiwara, Shigeru, 5,181,970, Cl. 148-610.000.
Tsuchitani, Masatoshi; Tamura, Makoto; Suzuki, Kiyotaka; Okada, Shuji; Nakajima, Ryoichi; and Naito, Sakae, to Maruzen Petrochemical Co., Ltd. Process for preparing pitches. 5,182,011, Cl. 208-39.000.
Tsuda, Yoshihisa, to UOP. Lipase immobilization without covalent bonding on an amphiphilic support containing lipophilic alkyl chains. 5,182,201, Cl. 435-176.000.
Tsuda, Yoshiyuki; and Iwamoto, Akiko, to Matsushita Refrigeration Company. Heat exchanger. 5,181,558, Cl. 165-133.000.
Tsuji, Mitsuji: *See*—
Furuta, Motonobu; and Tsuji, Mitsuji, 5,182,151, Cl. 428-36.920.
Tsuji, Toshinori; Hosoya, Koichi; Tsukimoto, Fumio; Ashida, Tatsuya; Okubo, Katsuyuki; Bokuhara, Tetsuo; and Shinzo, Toshiaki, to Osaka Gas Co., Ltd.; and Togawa Rubber Co., Ltd. Apparatus for running a wire through a pipe. 5,181,668, Cl. 242-54.00R.
Tsujita, Kenji: *See*—
Koizumi, Yoshiaki; Tsujita, Kenji; Kouno, Shigenori; and Ohmura, Ken, 5,182,181, Cl. 430-108.000.
Tsukada, Kiroku; and Kotani, Kunio, to Nippon Unicar Company Limited. Process for producing a modified ethylene/vinyl acetate copolymer. 5,182,072, Cl. 264-349.000.
Tsukamoto, Toshio; and Minami, Yoshihito, to Kabushiki Kaisha Komatsu Seisakusho. Device for fixing disk cutter to tunnel excavator. 5,181,577, Cl. 175-261.000.
Tsukimoto, Fumio: *See*—
Tsuji, Toshinori; Hosoya, Koichi; Tsukimoto, Fumio; Ashida, Tatsuya; Okubo, Katsuyuki; Bokuhara, Tetsuo; and Shinzo, Toshiaki, 5,181,668, Cl. 242-54.00R.
Tsuruta, Tadashi: *See*—
Saburi, Toshiki; Fujimoto, Masaya; Tsuruta, Tadashi; and Nunogaki, Naochika, 5,182,136, Cl. 427-126.300.
Tucciarone, John. Wallpaper trimming tool and its methods of use. 5,181,320, Cl. 30-123.000.
Tucker, John F., to Bausch & Lomb Incorporated. Post-plating passivation treatment. 5,182,172, Cl. 428-632.000.
Tuckey, Charles H., to Walbro Corporation. Quick connect fuel pump assembly. 5,181,839, Cl. 417-360.000.
Tuennermann, Wilfried: *See*—
Hoelscher, Hans-Juergen; Kerk, Thomas; Tuennermann, Wilfried; and Winnacker, Helmut, 5,182,731, Cl. 367-84.000.
Tuschy, Jorg O. P.: *See*—
Pape, Peter H. K.; and Tuschy, Jorg O. P., 5,182,156, Cl. 428-130.000.
Tuthill Corporation: *See*—
Hendzel, Adam J., 5,181,543, Cl. 138-90.000.
Ubukata, Yumiko: *See*—
Fuchikami, Takamasa; Ubukata, Yumiko; and Tanaka, Yasutaka, 5,182,246, Cl. 502-161.000.
Ucci, Pompelio A.: *See*—
Blyth, Randolph C.; and Ucci, Pompelio A., 5,182,154, Cl. 428-96.000.
Uchida, Kazuiki: *See*—
Itoh, Akira; Okamura, Kazuyoshi; and Uchida, Kazuiki, 5,182,486, Cl. 313-25.000.
Uda, Koji: *See*—
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Mizusawa, Nobutoshi; Suda, Shigeyuki; Nose, Noriyuki; and Kariya, Takao, 5,182,615, Cl. 356-400.000.
Ueda, Masanori; Tsuchinaga, Masamitsu; Iura, Teruo; and Fujiwara, Shigeru, to Nippon Steel Corporation. Process for production of stainless steel thin strip and sheet having superior surface gloss and high rusting resistance. 5,181,970, Cl. 148-610.000.
Ueda, Noriyoshi; Takahashi, Yuji; and Kitahara, Makoto, to Canon Kabushiki Kaisha. Sheet discharging device that chooses a sheet discharging speed according to the sheet's length or rigidity. 5,181,705, Cl. 271-3.000.
Uehara, Masatoshi: *See*—
Takaoka, Kazuhito; Uehara, Masatoshi; and Sano, Yumiko, 5,182,182, Cl. 430-124.000.
Uehara, Shinichi; Satou, Kouichi; and Baba, Seigo, to Nissei Asb Machine Co., Ltd. Apparatus for stretch blow molding hollow heat-resistant container. 5,182,122, Cl. 425-526.000.
Uekawa, Tatuo: *See*—
Ono, Hisao; Ito, Katsumi; Uekawa, Tatuo; and Ishikawa, Katsuhiro, 5,182,343, Cl. 526-240.000.
Uemura, Seiichi; Sohda, Yoshio; Kato, Osamu; Kouno, Takefumi; and Kihara, Tsutomu, to Nippon Oil Company, Limited. Process for preparing carbon/carbon composite. 5,181,979, Cl. 156-89.000.
Uenishi, Chikara: *See*—
Yamate, Kazunori; Kinoshita, Hideo; Uenishi, Chikara; Ugajin, Masafumi; Kidokoro, Shinichi; and Yamagiwa, Hiroshi, 5,182,497, Cl. 315-383.000.
Uenishi, Masahiro: *See*—
Matsui, Shigetomo; Uenishi, Masahiro; Iuchi, Sadao; Sugimoto, Kouji; Itoga, Kouyu; Harada, Tetsuzo; Michiba, Kouji; Onda, Katsuhiro; and Okumura, Takaaki, 5,182,775, Cl. 382-8.000.
Ueno, Fumio: *See*—
Shuto, Naoki; Ueno, Fumio; Goto, Yoshiko; Horiguchi, Akihiro; Kasori, Mitsuo; and Imai, Motomasa, 5,182,540, Cl. 338-223.000.
Ueno, Kiyoshi; and Bushimata, Teisuke, to Chiba Dies Co., Ltd. Gear. 5,181,433, Cl. 74-409.000.
Ueno, Naoto: *See*—
Ling, Nicholas C. K.; Ueno, Naoto; Shimasaki, Shunichi; Esch, Frederick S.; Ying, Shao-Yao; and Guillemin, Roger C. L., 5,182,375, Cl. 536-23.500.
Uesugi, Hiroshi: *See*—
Nishida, Minoru; Mizuno, Naohito; Ohtsuka, Yoshinori; Ozaki, Tadashi; and Uesugi, Hiroshi, 5,181,417, Cl. 73-115.000.
Ugajin, Masafumi: *See*—
Yamate, Kazunori; Kinoshita, Hideo; Uenishi, Chikara; Ugajin, Masafumi; Kidokoro, Shinichi; and Yamagiwa, Hiroshi, 5,182,497, Cl. 315-383.000.
Uggeri, Fulvio: *See*—
Felder, Ernst; Fumagalli, Luciano; Uggeri, Fulvio; and Vittadini, Giorgio, 5,182,370, Cl. 534-16.000.
Uji, Masanori: *See*—
Ozaki, Masahide; Uji, Masanori; Yamazaki, Makoto; and Ito, Tatsuo, 5,181,305, Cl. 29-408.000.
Ujita, Toshihiko: *See*—
Ikeda, Kazue; and Ujita, Toshihiko, 5,182,580, Cl. 346-140.00R.
Ulrich, Helmut: *See*—
Bartscher, Peter; Singbartl, Gunther; Petersen, Erwin; and Ulrich, Helmut, 5,181,418, Cl. 73-146.300.

Ultimizer's Inc.: *See*—
Cothrell, Leroy E., 5,181,445, Cl. 83-155.000.
Umaki, Yasuhide; Tomita, Rokuro; Hondo, Fumiaki; and Okada, Shigeru, to Nihon Cement Co., Ltd.; and Sanyo Chemical Industries, Ltd. Cement composition. 5,181,961, Cl. 106-724.000.
Umeda, Takao: *See*—
Nakazawa, Takashi; Ohshima, Minoru; Ishikawa, Masami; Ogawa, Tsukasa; Miyasaka, Tohru; and Umeda, Takao, 5,182,596, Cl. 355-203.000.
Unilever Patent Holdings B.V.: *See*—
Clayton, Richard A.; and Porter, Philip, 5,182,216, Cl. 436-518.000.
Union Camp Patent Holdings, Inc.: *See*—
White, David E.; Pikulin, Michael A.; Gandek, Thomas P.; and Friend, William H., 5,181,989, Cl. 162-241.000.
Union Carbide Industrial Gases Technology Corporation: *See*—
Bikson, Benjamin; Macheras, James T.; and Nelson, Joyce K., 5,181,940, Cl. 55-16.000.
Union Oil Company of California: *See*—
Gallup, Darrell L.; and Featherstone, John L., 5,182,027, Cl. 210-696.000.
Mueller, Mark D.; Jones, Frank L.; Quintana, Julio M.; Ruddy, Kenneth E.; and Mims, Michael G., 5,181,571, Cl. 166-381.000.
Unisys Corporation: *See*—
Nowak, Matthew M.; Rothenberger, Roland D.; and Vinson, Mark A., 5,182,629, Cl. 257-577.000.
United Dominion Industries, Inc.: *See*—
Shingler, Thomas M., 5,181,360, Cl. 52-520.000.
United Kingdom of Great Eritain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Bagg, Greville E., 5,181,996, Cl. 204-101.000.
United Microelectronics Corporation: *See*—
Ker, Ming-Dou; Lee, Chung-Yuan; and Wu, Chung-Yu, 5,182,220, Cl. 437-34.000.
United Solar Systems Corporation: *See*—
Nath, Prem; and Vogeli, Craig, 5,181,968, Cl. 136-256.000.
United States of America
Army: *See*—
Frankel, Julius; and Doxbeck, Mark, 5,182,139, Cl. 427-9.000.
Owens, Frank J., 5,182,254, Cl. 505-1.000.
Tardiff, Albert N., Jr.; and Grove, Corey M., 5,181,506, Cl. 128-201.220.
Energy: *See*—
Kozlowski, Lawrence J.; and Shirey, Lawrence A., 5,181,602, Cl. 200-43.015.
Health and Human Services: *See*—
Klein, David C.; Korf, Horst W.; and Bruce, Jeffrey N., 5,182,215, Cl. 436-514.000.
Leto, Thomas, 5,182,262, Cl. 514-13.000.
Interior: *See*—
Hiebert, Steven D., 5,181,479, Cl. 119-3.000.
National Aeronautics and Space Administration: *See*—
Connell, John W.; Hergenrother, Paul M.; and Wolf, Peter, 5,182,356, Cl. 528-128.000.
Diner, Daniel B.; and Venema, Steven C., 5,182,641, Cl. 358-103.000.
Navy: *See*—
Beezley, Dale L., 5,182,456, Cl. 250-551.000.
Liggett, Thomas, 5,182,092, Cl. 423-387.000.
Manheimer, Wallace M.; Robson, Anthony E.; and Meger, Robert A., 5,182,496, Cl. 315-111.410.
Talley, James C., 5,182,418, Cl. 102-475.000.
U.S. Philips Corp.: *See*—
Behagel, Frank P.; Poorter, Tiemen; and Nuijten, Petrus A. C. M., 5,182,479, Cl. 307-571.000.
Breeuwer, Marcel; and De With, Peter H. N., 5,182,645, Cl. 358-141.000.
Denneman, Jan W.; and Konings, Leonardus U. E., 5,182,503, Cl. 315-224.000.
Fuhren, Marcel, 5,182,634, Cl. 358-12.000.
Lydtin, Hans; and Clasen, Rolf, 5,182,052, Cl. 264-1.200.
Miyazaki, Akihiko, 5,182,649, Cl. 358-227.000.
Thuis, Robbert C., 5,182,537, Cl. 336-180.000.
United States Surgical Corporation: *See*—
Chesterfield, Michael P.; Koyfman, Ilya; and Hain, Matthew E., 5,181,923, Cl. 606-228.000.
Evans, Alfred G., 5,181,416, Cl. 73-104.000.
United Technologies Automotive: *See*—
Nonnenmacher, Ronald C.; Schulz, Kathleen; Lewis, Richard C.; and Riley, Richard, 5,181,313, Cl. 29-620.000.
United Technologies, Corp.: *See*—
Carlos, Joseph M.; Carstensen, Thomas A.; Hall, William J.; and Osiecki, Larry J., 5,182,150, Cl. 428-35.700.
Unitika Ltd.: *See*—
Nagasawa, Tsugio; Shuto, Tadashi; Matsumoto, Toshiaki; Sakuraya, Hideo; and Nishimoto, Shoji, 5,182,252, Cl. 503-227.000.
Universities Research Association, Inc.: *See*—
Lindenmeyer, Carl W., 5,182,686, Cl. 360-92.000.
University of Calif., The Regents of the: *See*—
Hopkins, Donald B., 5,182,524, Cl. 330-149.000.
University of Melbourne, The: *See*—
Chang, Joseph S.; and Tong, Yit C., 5,182,521, Cl. 328-167.000.
University of Minnesota, Regents of the: *See*—
Funkenbusch, Eric F.; Carr, Peter W.; Hahggi, Douglas A.; and Weber, Thomas P., 5,182,016, Cl. 210-198.200.
University of Oklahoma, Board of Regents of the: *See*—
Kline, Ronald A., 5,181,421, Cl. 73-597.000.
University of Washington, Board of Regents of the: *See*—
Kumar, Vipin, 5,182,307, Cl. 521-51.000.
Uno, Kazuo: *See*—
Yamada, Masato; Shirakawa, Junji; and Uno, Kazuo, 5,182,605, Cl. 355-274.000.
Uop: *See*—
Hedrick, Brian W., 5,181,557, Cl. 165-113.000.
Lomas, David A.; Haun, Edward C.; and Sechrist, Paul A., 5,182,085, Cl. 422-144.000.
Tsuda, Yoshihisa, 5,182,201, Cl. 435-176.000.
Upjohn Company, The: *See*—
Brickner, Steven J., 5,182,403, Cl. 548-231.000.
Urata, Kaoru, to Sony Corporation. Non-linear de-emphasis circuit. 5,182,520, Cl. 328-142.000.
Uren, Dean P.; and Anderson, James D. Water ski boot and binding. 5,181,332, Cl. 36-114.000.
Uryu Siesaku, Ltd.: *See*—
Maruyama, Junichi; Fukumura, Teruo; and Kawaguchi, Sadatsugu, 5,181,575, Cl. 173-180.000.
Ushiki, Hiroshi; and Noboru, Fujino, to Kabushiki Kaisha Shinkawa. Lead frame holding apparatus for use in wire bonders. 5,181,646, Cl. 228-4.500.
Usui, Kazushi; Fujikawa, Takashi; and Ohki, Katsuyoshi, to Cosmo Research Institute; and Cosmo Oil Co., Ltd. Catalyst composition for hydrodesulfurization of hydrocarbon oil and process for producing the same. 5,182,250, Cl. 502-314.000.
Usui Kokusai Sangyo Kaisha Ltd.: *See*—
Mita, Yoshiyuki, 5,181,554, Cl. 165-41.000.
Uzawa, Shunichi: *See*—
Kurosawa, Hiroshi; Uda, Koji; Ozawa, Kunitaka; Uzawa, Shunichi; Mizusawa, Nobutoshi; Suda, Shigeyuki; Nose, Noriyuki; and Kariya, Takao, 5,182,615, Cl. 356-400.000.
Uziel, Yehoram: *See*—
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.
V. Kann Rasmussen Industri A/S: *See*—
Lindgren, Claes; Moller, Brent; Petersen, Flemming O.; and Vigenberg, Stig F., 5,181,340, Cl. 49-371.000.
Vaahs, Tilo; Peuckert, Marcellus; and Bruck, Martin, to Hoechst Aktiengesellschaft. Polymeric chlorosilazanes, process for their preparation, ceramic materials containing silicon nitride which can be manufactured therefrom, and their manufacture. 5,182,411, Cl. 556-409.000.
Valdshtein, George: *See*—
Masel, Ruben; and Valdshtein, George, 5,181,455, Cl. 99-391.000.
Valentine, Douglas H. Pool stick apparatus. 5,181,718, Cl. 273-69.000.
Valeo Equipements Electriques Moteur: *See*—
Pierret, Jean-Marie; and Michel, Didier, 5,182,511, Cl. 324-158.0MG.
Valeo Vision: *See*—
Segaud, Daniel, 5,182,494, Cl. 315-80.000.
Valkeinen, Osmo E. O.: *See*—
Tanttu, Pekka; and Valkeinen, Osmo E. O., 5,181,652, Cl. 229-243.000.
Vallat, Jean-Noel: *See*—
Gubin, Jean; Chatelain, Pierre; Descamps, Marcel; Nisato, Dino; Inion, Henri; Lucchetti, Jean; Mahaux, Jean-Marie; and Vallat, Jean-Noel, 5,182,291, Cl. 514-300.000.
Vamco Machine & Tool, Inc.: *See*—
Gentile, Joseph P.; and Martin, Vaughn H., 5,181,642, Cl. 226-137.000.
Vamvakaris, Christos: *See*—
Derber, Bernd; Hansen, Guenter; Reichelt, Helmut; Vamvakaris, Christos; and Zeidler, Georg, 5,182,372, Cl. 534-857.000.
Van Leer Metallized Products (U.S.A.) Limited: *See*—
Fitch, John J., 5,182,157, Cl. 428-137.000.
Van Allman, Don T.; and Corbin, Amos, to Illinois Tool Works Inc. Method and apparatus for making a forming pin. 5,181,886, Cl. 470-40.000.
Van Brunt, Karl B., Jr.; and Petrozello, James R., to International Business Machines Corporation. Fluid pressure actuated electrical connector. 5,181,853, Cl. 439-67.000.
Van den Bossche, Dominique: *See*—
Favre, Christian; and Van den Bossche, Dominique, 5,181,380, Cl. 60-405.000.
Vanderhider, J. Alan: *See*—
Meyer, Louis W.; Vanderhider, J. Alan; and Carswell, Robert, 5,182,034, Cl. 252-32.500.
Van Der Putten, Joost W. H.: *See*—
Kusters, Johannes K. O.; and Van Der Putten, Joost W. H., 5,182,120, Cl. 425-238.000.
Van Der Puy, Michael, to Allied-Signal Inc. Azeotrope-like compositions of 1,1,1-trifluorohexane and perfluoromethylcyclohexane. 5,182,042, Cl. 252-172.000.
van de Veen, Paul G., to Otto Bock Orthopaedische Industrie Besitz- und Verwaltungs-Kommanditgesellschaft. Swivel connection between two parts of an orthopedic technical aid. 5,181,931, Cl. 623-40.000.
van Hattem, Jan C.; and Sperna Weiland, Jan A. E., to Sara Lee/DE N.V. Device for withdrawing liquid from a reservoir by means of a water jet device. 5,181,753, Cl. 285-205.000.

Van Hove, James M.: *See—*
Khan, Muhammad A.; Kuznia, Jonathon N.; and Van Hove, James M., 5,182,670, Cl. 359-359.000.

Vann, Richard D.; and Gerth, Wayne A., to Duke University. Method for improving a biomaterial's resistance to thrombosis and infection and for improving tissue ingrowth. 5,181,903, Cl. 600-36.000.

Van Note, Paul C.: *See—*
Fitzgibbons, Patrick J.; Lee, Ho C.; Stone, Lawrence A.; and Van Note, Paul C., 5,181,465, Cl. 101-103.000.

Van Voris, Peter: *See—*
Burton, Frederick G.; Cataldo, Dominic A.; Cline, John F.; Skiens, W. Eugene; and Van Voris, Peter, 5,181,952, Cl. 504-347.000.

Vanzura, Jiri : *See—*
Kasafirek, Evzen; Plaisner, Vaclav; Korbova, Libuse; Kohout, Jirj; Cizkova, Jirina; Krejci, Ivan; Pospisil, Arnost; Pesak, Milan; Sturc, Antonin; Krepelka, Jiri ; Dlabac, Antonin; and Vanzura, Jiri , 5,182,285, Cl. 514-255.000.

Vasconcellos, Stephen R.: *See—*
Liao, Wen P.; Chen, Fu; and Vasconcellos, Stephen R., 5,182,331, Cl. 525-294.000.

Vaughn, Jack M.: *See—*
Benson, Robert W.; Beiley, Mark J.; Sareshwala, Sohel A.; Croft, Steven T.; and Vaughn, Jack M., 5,181,752, Cl. 285-81.000.

Veit, Werner: *See—*
Prager, Bernhard C.; Wessely, Karl; and Veit, Werner, 5,182,383, Cl. 540-225.000.

Vendel, Albert S.: *See—*
Leondaridis, Paul; Vendel, Albert S.; and Akthar, Tarranum, 5,182,088, Cl. 423-210.000.

Venema, Steven C.: *See—*
Diner, Daniel B.; and Venema, Steven C., 5,182,641, Cl. 358-103.000.

Venia, Steven P.: *See—*
Campbell, Richard J.; Miller, George G.; and Venia, Steven P., 5,181,294, Cl. 15-315.000.

Vens, Gregory C.: *See—*
Smith, Rodney P.; and Vens, Gregory C., 5,181,366, Cl. 53-470.000.

Vente, Paul; and Wolfgarten, Achim, to Bayer Aktiengesellschaft. Cable plug for spark plugs. 5,181,856, Cl. 439-125.000.

Vermesh, Michael: *See—*
Bergman, Arieh; Freedy, Amos; and Vermesh, Michael, 5,181,919, Cl. 606-144.000.

Veronesi, Sergio: *See—*
Bastetti, Giuseppe; and Veronesi, Sergio, 5,182,129, Cl. 426-589.000.

Viaud, Jean, to Deere & Company. Round baler starter roll having easily changeable surface elements for modifying the aggressiveness of the roll. 5,181,461, Cl. 100-88.000.

Vickers, Incorporated: *See—*
Niemiec, Albin J., 5,181,837, Cl. 417-350.000.

Viebach, Thomas; Kreibich, Rainer; Nuber, Bernd; Pauker, Robert; and Hesse, Alexander, to Dornier Medizintechnik GmbH. Lithotripter including a holding device for an ultrasound locating transducer. 5,181,512, Cl. 128-660.030.

Viel, Wolfgang: *See—*
Philipps, Michael; Schad, Hans-Dieter; and Viel, Wolfgang, 5,181,423, Cl. 73-724.000.

Vigenberg, Stig F.: *See—*
Lindgren, Claes; Moller, Brent; Petersen, Flemming O.; and Vigenberg, Stig F., 5,181,340, Cl. 49-371.000.

Villa, Cindy S.; and Villa, Johnny, Jr., to Atlantic Richfield Company. Portable pump system. 5,181,833, Cl. 417-234.000.

Villa, Johnny, Jr.: *See—*
Villa, Cindy S.; and Villa, Johnny, Jr., 5,181,833, Cl. 417-234.000.

Vinci, Alfredo; and Cummings, Kenneth R., to Church & Dwight Co., Inc. Ruminant feed supplement. 5,182,126, Cl. 426-74.000.

Vinson, Mark A.: *See—*
Nowak, Matthew M.; Rothenberger, Roland D.; and Vinson, Mark A., 5,182,629, Cl. 257-577.000.

Vinson, Wayne A.: *See—*
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.

Viranyi, Ferenc: *See—*
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 5,182,277, Cl. 514-231.200.

Virginia Commonwealth University: *See—*
Byron, Peter R.; and Dalby, Richard N., 5,182,097, Cl. 424-45.000.

Vittadini, Giorgio: *See—*
Felder, Ernst; Fumagalli, Luciano; Uggeri, Fulvio; and Vittadini, Giorgio, 5,182,370, Cl. 534-16.000.

Vivier, Pierre: *See—*
Prats, Christian; and Vivier, Pierre, 5,181,929, Cl. 623-23.000.

Voelker, Heinz; Alicke, Gerhard; Schuch, Horst; Weilbacher, Manfred; and Weber, Reinhold, to BASF Aktiengesellschaft. Production of foam sheets of high compressive strength. 5,182,308, Cl. 521-79.000.

Vogel, Albrecht: *See—*
Schwiegk, Stefan; Mathauer, Klemens; Wegner, Gerhard; Hoffmann, Bernd F. W.; and Vogel, Albrecht, 5,182,005, Cl. 204-435.000.

Vogeli, Craig: *See—*
Nath, Prem; and Vogeli, Craig, 5,181,968, Cl. 136-256.000.

Vogt, Wilfried: *See—*
Merkel, Gerd; Vogt, Wilfried; Glaunsinger, Georg; Stadler, Peter; Zander, Claus-Peter; Maass, Jurgen; Schmitt, Gernot; Necker, Thomas; and Becker, Willi, 5,181,469, Cl. 101-415.100.

Volk, Henry J. Method and apparatus for trussing poultry. 5,181,880, Cl. 452-174.000.

Volkert, John K., to Papermasters, Inc. Methods of making pop-up promotional items. 5,181,901, Cl. 493-331.000.

von Ballmoos, Roland: *See—*
Brown, Stephen H.; and von Ballmoos, Roland, 5,182,243, Cl. 502-79.000.

von Bonin, Wulf, to Bayer Aktiengesellschaft. Intumescence media and the use thereof. 5,182,049, Cl. 252-378.00R.

von Gizycki, Ulrich: *See—*
Giesecke, Henning; Wolf, Gerhard D.; Muller, Hanns P.; von Gizycki, Ulrich; and Wienkenhover, Martin, 5,182,135, Cl. 427-98.000.

von Gruenberg, Hubertus: *See—*
Schiel, Lothar; von Gruenberg, Hubertus; Wagner, Wilfried; Rueffer, Manfred; and Jung, Christoph, 5,181,769, Cl. 303-114.300.

von Gutfeld, Robert J.: *See—*
Donelon, John J.; Doyle, James P.; Hurst, Jerry E., Jr.; Oprysko, Modest M.; Rossnagel, Stephen M.; and von Gutfeld, Robert J., 5,182,230, Cl. 437-173.000.

Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., to 3D Systems, Inc. Rapid and accurate production of stereolighographic parts. 5,182,715, Cl. 364-474.240.

Vossen, Franz; and Stoppel, Karl-Anton, to Meurer Nonfood Product GmbH. Apparatus for removing break-out portions from a sheet of material or the like. 5,181,640, Cl. 225-93.000.

Vyas, Navin N.: *See—*
Joyce, James L., Jr.; Jones, Warren C.; Rowlette, John R., Sr.; MacInnes, David F., Jr.; and Vyas, Navin N., 5,182,050, Cl. 252-500.000.

W. F. Meyers Company, Inc.: *See—*
Fish, Donald D.; and Standish, James K., 5,181,503, Cl. 125-21.000.

W. L. Gore & Associates, Inc.: *See—*
Savegh, Emile G.; Martinez, John E.; and Cedrone, Alfredo, 5,182,785, Cl. 385-128.000.

WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
Bartscher, Peter; Singbartl, Gunther; Petersen, Erwin; and Ulrich, Helmut, 5,181,418, Cl. 73-146.300.

Wachendorff-Neumann, Ulrike: *See—*
Seitz, Thomas; Klausener, Alexander; Berg, Dieter; Wachendorff-Neumann, Ulrike; Erdelen, Christoph; Hanssler, Gerd; Brandes, Wilhelm; and Dutzmann, Stefan, 5,182,286, Cl. 514-256.000.

Wachter, Michael P.: *See—*
Murray, William V.; and Wachter, Michael P., 5,182,288, Cl. 514-278.000.

Wacker-Chemie GmbH: *See—*
Braeunling, Hermann; Becker, Richard; and Bloechl, Georg, 5,182,348, Cl. 526-256.000.

Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*
Lampert, Ingolf; and Gratzl, Christa, 5,181,985, Cl. 156-635.000.

Wacker Silicones Corporation: *See—*
Hart, George M.; and Hayford, Mark E., 5,182,142, Cl. 427-393.500.

Wacoh Corporation: *See—*
Okada, Kazuhiro, 5,182,515, Cl. 324-259.000.

Wada, Akira: *See—*
Yasuda, Go; and Wada, Akira, 5,182,061, Cl. 264-72.000.

Wada, Kazushi: *See—*
Iizuka, Tetsuya; Yonemoto, Kazuya; Wada, Kazushi; Nakamura, Satoshi; and Harada, Koichi, 5,182,622, Cl. 257-231.000.

Waern, Roland: *See—*
Jonsson, Eston; and Waern, Roland, 5,182,099, Cl. 424-49.000.

Wagner, Gerhard: *See—*
Zaiser, Wolfgang; Merkle, Hans; Wagner, Gerhard; and Spengler, Gerhard, 5,181,431, Cl. 74-333.000.

Wagner, Hans: *See—*
Breuker, Walter; Wagner, Hans; Moller, Eckhard; and Schleimer, Bernhard, 5,181,987, Cl. 159-4.080.

Wagner, Paul M.: *See—*
Devaney, Mark J., Jr.; Frank, Lee F.; Helfer, Jeffrey L.; Kocher, Haribhajan S.; and Wagner, Paul M., 5,181,329, Cl. 34-156.000.

Wagner, Rolf: *See—*
Danho, Waleed; Tilley, Jefferson W.; Triscari, Joseph; and Wagner, Rolf, 5,182,263, Cl. 514-16.000.

Wagner Spray Tech Corporation: *See—*
Reents, Terry R., 5,181,832, Cl. 417-234.000.

Wagner, Wilfried: *See—*
Schiel, Lothar; von Gruenberg, Hubertus; Wagner, Wilfried; Rueffer, Manfred; and Jung, Christoph, 5,181,769, Cl. 303-114.300.

Wahl, Friedrich G.: *See—*
Andrews, Howard W., Jr.; Kowalski, John A.; and Wahl, Friedrich G., 5,181,297, Cl. 24-336.000.

Wakefield, Earlby E. J.: *See—*
Borys, Tadeusz; Lee, Shueh-Mo; and Wakefield, Earlby E. J., 5,182,141, Cl. 427-379.000.

Wakeman, Thomas G.; Walker, Alan; and Maclin, Harvey M., to General Electric Company. Gas turbine engine multi-hole film cooled combustor liner and method of manufacture. 5,181,379, Cl. 60-261.000.

Waki, Michio; and Takada, Shinzo, to Kabushiki Kaisha TOPCON. Semiconductor laser drive apparatus. 5,182,756, Cl. 372-38.000.

Wakimoto, Fumiyoshi: *See*—
Iwai, Noriyuki; Sasaki, Kimito; Yano, Masaru; Wakimoto, Fumiyoshi; Tokunaga, Wataru; and Shirakura, Masaru, 5,182,676, Cl. 359-841.000.

Wakino, Kikuo; and Fukutani, Iwao, to Murata Manufacturing Co., Ltd. Connector. 5,181,864, Cl. 439-620.000.

Wakuda, Osamu: *See*—
Takata, Souichi; Namba, Toyoaki; Okada, Kenji; and Wakuda, Osamu, 5,181,710, Cl. 271-98.000.
Yamamoto, Hiranaga; Takata, Souichi; Wakuda, Osamu; and Namba, Toyoaki, 5,181,706, Cl. 271-11.000.

Wakumura, Shin-ichi: *See*—
Hatanaka, Yuuji; Okamoto, Hiroo; Arai, Takao; Wakumura, Shin-ichi; Miyake, Ichiro; and Sakamoto, Shunichiro, 5,182,678, Cl. 360-32.000.

Walach, Eugeniusz: *See*—
Chevion, Dan S.; Karnin, Ehud D.; and Walach, Eugeniusz, 5,182,656, Cl. 358-452.000.

Walbro Corporation: *See*—
Tuckey, Charles H., 5,181,839, Cl. 417-360.000.

Walker, Alan: *See*—
Wakeman, Thomas G.; Walker, Alan; and Maclin, Harvey M., 5,181,379, Cl. 60-261.000.

Walker, Clarence L.: *See*—
Sunderland, Richard A.; Walker, Clarence L.; and Davis, Mark A., 5,181,842, Cl. 417-474.000.

Wallace, Edward S.: *See*—
Bandy, Thomas R.; Read, Donna A.; and Wallace, Edward S., 5,182,051, Cl. 252-645.000.

Wallace, Robert D.: *See*—
Eaton, Douglas G.; and Wallace, Robert D., 5,181,670, Cl. 242-67.10R.

Walls, Edward W., Jr.: *See*—
Kopolow, Stephen L.; Tazi, Mohammed; and Walls, Edward W., Jr., 5,182,098, Cl. 424-47.000.

Walsh, James H. Removable anchor tube assembly. 5,181,816, Cl. 411-60.000.

Walters, David N.: *See*—
Martz, Jonathan T.; Schimmel, Karl F.; Sundararaman, Padmanabhan; and Walters, David N., 5,182,355, Cl. 528-75.000.

Waltzer, Jeremy S.: *See*—
Carpenter, Lester E.; Schmitt, Wayne I.; Snell, Laurence; Bieber, David; Stucke, Donald W.; and Waltzer, Jeremy S., 5,181,590, Cl. 190-18.00A.

Wanderer, Alan A.; and Sagstetter, William E., to Medical Safety Products, Inc. Needle guard for blood collection. 5,181,524, Cl. 128-764.000.

Wang, Carl: *See*—
Blumenkanz, Mark S.; and Wang, Carl, 5,181,922, Cl. 606-202.000.

Wang, Chiou-Liang. Electric soldering iron with forked suction pipe for removing soldering smoke and cooling the handle of the soldering iron. 5,182,435, Cl. 219-230.000.

Wang, Hsien-Chang: *See*—
Fusco, James V.; Wang, Hsien-Chang; and Powers, Kenneth W., 5,182,350, Cl. 526-308.000.
Powers, Kenneth W.; Wang, Hsien-Chang; Handy, Debra C.; and Fusco, James V., 5,182,333, Cl. 525-315.000.

Wang, Jia-Tarng: *See*—
Nelson, Carl; and Wang, Jia-Tarng, 5,182,219, Cl. 437-27.000.

Wang Laboratories, Inc.: *See*—
Makus, Peter M., 5,182,709, Cl. 364-419.000.

Wang, Ren; Wu, Shanliang; and Zhang, Zhigang, to East China University of Chemical Technology. Non-precious metal three way catalyst. 5,182,249, Cl. 502-303.000.

Ward, Bobby G.: *See*—
Hawk, Gary W.; Hayes, Earl J.; Hunt, Alexander, III; and Ward, Bobby G., 5,181,862, Cl. 439-595.000.

Ward, John B.; Noble, Hazel M.; Porter, Neil; Fletton, Richard A.; and Noble, David, to American Cyanamid Company. Strains of *Streptomyces thermoarchaensis*. 5,182,207, Cl. 435-253.500.

Ward, John S., to Novo Nordisk A/S. Heterocyclic compounds their preparation and use. 5,182,283, Cl. 514-254.000.

Ward, Peter; and Glen, Stephen J., to British Gas plc. Moling system including transmitter-carrying mole for detecting and displaying the roll angle of the mole. 5,182,516, Cl. 324-326.000.

Warddrip, Riley L.: *See*—
Braswell, Charles D.; Carley, Robert E.; and Warddrip, Riley L., 5,182,607, Cl. 355-323.000.

Warden, Victor N.: *See*—
Caldwell, J. Brian; Banash, Mark A.; Che, Tessie M.; Mininni, Robert M.; and Warden, Victor N., 5,182,236, Cl. 521-12.000.

Warkentin, A. James. Off-loading conveying system. 5,181,596, Cl. 198-365.000.

Wass, Donald J.; and Carter, Anthony E., to Daniel Industries, Inc. Orifice system mounting assembly. 5,181,542, Cl. 138-44.000.

Watanabe, Hiroshi: *See*—
Kitamura, Shigehiro; Watanabe, Hiroshi; and Abe, Takao, 5,182,160, Cl. 428-195.000.

Watanabe, Katsuhiko: *See*—
Mimasu, Kazuo; Watanabe, Katsuhiko; and Suzuki, Nobutoshi, 5,182,691, Cl. 360-128.000.

Watanabe, Keiko: *See*—
Ohta, Kiyohiko; Kamiya, Kaoru; Watanabe, Keiko; Nakagawa, Makoto; and Nagao, Tomio, 5,181,604, Cl. 206-5.100.

Watanabe, Kunio: *See*—
Honma, Kazuhiro; Watanabe, Kunio; Morita, Takeshi; and Nanao, Shingo, 5,181,860, Cl. 439-321.000.

Watanabe, Sumio; and Ishizu, Nobuhiko, to Taiyo Kogyo Corporation. Method of fabricating a flexible container. 5,181,900, Cl. 493-210.000.

Watanabe, Tadashi: *See*—
Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, 5,182,140, Cl. 427-230.000.

Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, to N.E. Chemcat Corporation. Method and apparatus for liquid coating for honeycomb structure. 5,182,140, Cl. 427-230.000.

Watanabe, Tetsu; Kawashima, Tetsuji; and Fujita, Goro, to Sony Corporation. Magneto-optical recording apparatus with pulse driven light beam and variable delay of magnetic field reversals based on recording medium characteristics. 5,182,734, Cl. 369-13.000.

Watanabe, Tsunao: *See*—
Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, 5,182,140, Cl. 427-230.000.

Watanabe, Yutaka: *See*—
Iizuka, Takashi; Watanabe, Yutaka; and Fukuda, Yasuaki, 5,182,763, Cl. 378-34.000.

Watkins, Joseph J.: *See*—
Fagrodia, Shriram; Fagerburg, David R.; Watkins, Joseph J.; and Lawrence, Paul B., 5,182,345, Cl. 525-462.000.

Watkins, Robert W., to Schering Corporation. Angiotensin II receptor blockers as antiglaucoma agents. 5,182,264, Cl. 514-16.000.

Watt, Richard L., to Weber-Knapp Company. Counterbalance mechanism. 5,181,620, Cl. 211-59.300.

Watts, Ridley. Coil dunnage and package using same. 5,181,614, Cl. 206-584.000.

Waugh, Geoffrey S.: *See*—
Kelly, Larry R.; and Waugh, Geoffrey S., 5,182,530, Cl. 333-18.000.

Wayne/Scott Fetzer Company: *See*—
Kirkland, Dan R., 5,181,841, Cl. 417-423.300.

Weatherford-Petco, Inc.: *See*—
Lindley, John D.; Mackenzie, Colin R.; and Hall, Mark E., 5,181,564, Cl. 166-55.600.

Webasto AG Fahrzeugtechnik: *See*—
Pohl, Peter; and Gruber, Reinhold, 5,181,891, Cl. 475-162.000.

Weber, Adam: *See*—
Botz, Jakob; Hofmann, Georg; and Weber, Adam, 5,182,422, Cl. 200-61.540.
Botz, Jakob; Hofmann, Georg; and Weber, Adam, 5,182,423, Cl. 200-61.540.

Weber, Ekkehard, to Metallgesellschaft Aktiengesellschaft. Process and apparatus for separating liquid ash. 5,181,943, Cl. 55-98.000.

Weber, Jurgen; Lappe, Peter; and Springer, Helmut, to Hoechst Aktiengesellschaft. Process for the preparation of esters of 5-alkylpyridine-2,3-dicarboxylic acid. 5,182,400, Cl. 546-250.000.

Weber, Kenneth E.: *See*—
Creasman, Edwin A.; Paul, Thomas R.; Weber, Kenneth E.; Navarrete, David R.; McCullough, Jimmy D.; and Soodjinda, Churchai T., 5,182,053, Cl. 264-1.400.

Weber-Knapp Company: *See*—
Watt, Richard L., 5,181,620, Cl. 211-59.300.

Weber, Rainer: *See*—
Lonhoff, Norbert; Schmidt, Ludwig; Block, Hans-Dieter; and Weber, Rainer, 5,181,994, Cl. 204-97.000.

Weber, Raymond; and Wunnenberg, Wolfgang, to Bergwerksverband GmbH. Container for bulk material with discharge chute. 5,181,633, Cl. 222-195.000.

Weber, Reinhold: *See*—
Voelker, Heinz; Alicke, Gerhard; Schuch, Horst; Weilbacher, Manfred; and Weber, Reinhold, 5,182,308, Cl. 521-79.000.

Weber, Thomas P.: *See*—
Funkenbusch, Eric F.; Carr, Peter W.; Hahggi, Douglas A.; and Weber, Thomas P., 5,182,016, Cl. 210-198.200.

Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot or flower pot cover with pleated skirt and or base. 5,181,339, Cl. 47-72.000.

Weder, Donald E., to Highland Supply Corporation. Wrapping a floral grouping with sheets having adhesive or cohesive material applied thereto. 5,181,364, Cl. 53-397.000.

Wegner, Gerhard: *See*—
Schwiegk, Stefan; Mathauer, Klemens; Wegner, Gerhard; Hoffmann, Bernd F. W.; and Vogel, Albrecht, 5,182,005, Cl. 204-435.000.

Weilbach, August O.: *See*—
Sherman, Randy J.; Weilbach, August O.; Hanson, Derald F.; and Smith, C. Dwight, 5,181,783, Cl. 384-114.000.

Weilbacher, Manfred: *See*—
Voelker, Heinz; Alicke, Gerhard; Schuch, Horst; Weilbacher, Manfred; and Weber, Reinhold, 5,182,308, Cl. 521-79.000.

Weimer, Charles M., to Pitney Bowes Inc. Method and apparatus for connecting a device to a printed circuit board. 5,182,700, Cl. 361-400.000.

Weispfenning, Gerald L.; and Goss, Lloyd C., to Seagate Technology, Inc. Sectored servo disk formatting. 5,182,682, Cl. 360-77.080.

Welch, William E.: *See*—
Miller, John C.; and Welch, William E., 5,182,039, Cl. 252-61.000.

Wellman, Charles G., to AIP inc. Ball lock punch retainer. 5,181,438, Cl. 73-107.100.

Wells, James A.: *See*—
Estell, David A.; Bott, Richard R.; Power, Scott D.; and Wells, James A., 5,182,204, Cl. 435-222.000.

Welsh, David E., to ITT Corporation. EMI shielding backshell system. 5,181,863, Cl. 439-610.000.

Wendelborn, Dieter. Blood sampling device with blood-viewing chamber. 5,181,523, Cl. 128-764.000.

Wendt, Friedrich-Karl: *See*—
Lange, Ulrich V.; Daub, Wolfgang; and Wendt, Friedrich-Karl, 5,182,432, Cl. 219-202.000.

Wenzl, Helmut: *See*—
Chakraborty, Amiya K.; Rohde, Jurgen; Klatt, Karl-Heinz; Wenzl, Helmut; and Konrad, Ralf, 5,181,845, Cl. 431-7.000.

Wertheim, David F. P.; Oozeer, Rowena C.; Dubowitz, Victor; Connell, John A.; and Brydon, John W. E., to Royal Postgraduate Medical School. Method and apparatus for analyzing an electro-encephalogram. 5,181,520, Cl. 128-731.000.

Wessely, Karl: *See*—
Prager, Bernhard C.; Wessely, Karl; and Veit, Werner, 5,182,383, Cl. 540-225.000.

Westinghouse Electric Corp.: *See*—
Blinchikoff, Herman J.; and Schofield, Ann C., 5,182,563, Cl. 342-32.000.
Gray, Lewis; Garbarino, Joseph L.; Micol, John S.; Crenshaw, Johnny W.; Iacono, Vincent M.; Barley, James C.; Hollen, Richard L.; and Graziani, Terry M., 5,181,308, Cl. 29-436.000.
Pirl, William E.; Smith, Edward H.; Roth, Charles H., Jr.; Lutz, Rodney A.; and Anderson, John J., 5,182,429, Cl. 219-121.630.
Schauder, Colin D., 5,182,508, Cl. 318-801.000.

Westvaco Corporation: *See*—
LeBlanc, Paul J.; and Schilling, Peter, 5,182,326, Cl. 524-514.000.

WGM Safety Corp.: *See*—
Michel, M. John; Snyder, Frederick D.; and Emany, Venkateswara R., 5,181,507, Cl. 128-201.250.

Wheat, James A.; Fuoco, Rolland P.; and Dix, J. Kimberley, to Minister of National Defence of Her Majesty's Canadian Government. Flame retardant foam material. 5,182,163, Cl. 428-224.000.

Wheaton, Harold L.: *See*—
Blazek, William S.; and Wheaton, Harold L., 5,181,550, Cl. 164-100.000.

Wheeler, Basil W. Method of making a very compact audio warning system. 5,181,301, Cl. 29-169.500.

Wheeler, James M., to Wheeler, James M.; and Wheeler, Louise K. Gooseneck trailer hitch lock. 5,181,405, Cl. 70-232.000.

Wheeler, Louise K.: *See*—
Wheeler, James M., 5,181,405, Cl. 70-232.000.

Wheland, Robert C.: *See*—
Feiring, Andrew E.; Krespan, Carl G.; Resnick, Paul R.; Smart, Bruce E.; Treat, Theodore A.; and Wheland, Robert C., 5,182,342, Cl. 526-206.000.

Whitcraft, Charles E., Jr.: *See*—
Bolesky, Richard; Smith, Todd S.; and Whitcraft, Charles E., Jr., 5,181,928, Cl. 623-23.000.

White, David E.; Pikulin, Michael A.; Gandek, Thomas P.; and Friend, William H., to Union Camp Patent Holdings, Inc. Reactor for bleaching high consistency pulp with ozone. 5,181,989, Cl. 162-241.000.

Whitfield, Richard G.: *See*—
Merritt, Alfred R.; Cooke, Theodore M.; Lin, An-Chung R.; and Whitfield, Richard G., 5,182,572, Cl. 346-1.100.

Wick, Richard J., to Exxon Chemical Patents Inc. Process for producing micropattern-embossed oriented elastomer films. 5,182,069, Cl. 264-210.200.

Widnall, Sheila E.; Widnall, William S.; Gorgen, William E.; and Evernham, Jeffrey T., to Flex Foil Technology, Inc. Flexible tailored elastic airfoil section. 5,181,678, Cl. 244-219.000.

Widnall, William S.: *See*—
Widnall, Sheila E.; Widnall, William S.; Gorgen, William E.; and Evernham, Jeffrey T., 5,181,678, Cl. 244-219.000.

Wiener, Hattie. Chair and seat apparatus, and methods of constructing and utilizing same. 5,181,764, Cl. 297-452.000.

Wienkenhover, Martin: *See*—
Giesecke, Henning; Wolf, Gerhard D.; Muller, Hanns P.; von Gizycki, Ulrich; and Wienkenhover, Martin, 5,182,135, Cl. 427-98.000.

Wiersema, Richard J.: *See*—
Rowland, Richard R.; Fong, Ronald A.; Wiersema, Richard J.; and Zielske, Alfred G., 5,182,045, Cl. 252-186.380.

Wiezer, Hartmut: *See*—
Geissler, Ulrich; and Wiezer, Hartmut, 5,182,187, Cl. 430-271.000.

Wikstrom, Jan A.; Birrittella, Mark S.; Kiefer, David; Smetana, Stephen B.; and Swanson, Vernon W., to Cray Research, Inc. Emitter emitter logic (EEL) and emitter collector dotted logic (ECDL) families. 5,182,473, Cl. 307-454.000.

Wiktorowicz, John E., to Applied Biosystems, Inc. Capillary electrophoresis method with polymer tube coating. 5,181,999, Cl. 204-180.100.

Wilder, Harold J., to Custom Metallizing Services, Inc. Retrofittable vapor source for vacuum metallizing utilizing spatter reduction means. 5,182,567, Cl. 392-389.000.

William Electronics Games, Inc.: *See*—
Krutsch, John R.; and Jayswal, Manu, 5,181,722, Cl. 273-127.00B.

Williams, Charles E., to Hufcor, Inc. Reinforced carrier disc for operable partition system. 5,181,296, Cl. 16-95.00R.

Williams, Glen R.: *See*—
D'Agostino, William L.; Barrick, Michael D.; and Williams, Glen R., 5,182,779, Cl. 385-13.000.

Wilson, James B. S.; Serle, Peter M.; and Siroky, Zdenek, to Roads Corporation. Removable barrier. 5,181,794, Cl. 404-6.000.

Wilson, Thomas G.: *See*—
Ayers, Richard C.; and Wilson, Thomas G., 5,181,561, Cl. 165-162.000.

Winandy, Carol M. Tatting shuttle with disposable bobbin. 5,181,449, Cl. 87-58.000.

Winn, Shelley R.: *See*—
Aebischer, Patrick; and Winn, Shelley R., 5,182,111, Cl. 424-424.000.

Winnacker, Helmut: *See*—
Hoelscher, Hans-Juergen; Kerk, Thomas; Tuennermann, Wilfried; and Winnacker, Helmut, 5,182,731, Cl. 367-84.000.

Winston, William G.: *See*—
Petersen, Philip R.; Robbins, III: Frederick P.; and Winston, William G., 5,182,013, Cl. 208-348.000.

Winters, Suzanne; Solen, Kenneth A.; Sanders, Clifton G.; Mortensen, J. D.; and Berry, Gaylord, to Cardiopulmonics, Inc. Multifunctional thrombo-resistant coatings and methods of manufacture. 5,182,317, Cl. 523-112.000.

Wiser Oy: *See*—
Jarvenpaa, Viljo, 5,181,944, Cl. 55-235.000.

Wistar Institute, The: *See*—
Steplewski, Zenon; Koprowski, Hilary; and Thurin, Magdalena, 5,182,192, Cl. 435-7.230.

Witco Corporation: *See*—
Mark, Harold; and Stahman, Kenneth J., 5,181,960, Cl. 106-419.000.

Witte, Franz, to Deutsche Forschungsanstalt fur Luft- und Raumfahrt. Forward looking radar. 5,182,562, Cl. 342-25.000.

Wojcik, Hendricus T., to Thomas Regout N.V. Ball cage for a telescopic rail, comprising a cage buffer. 5,181,781, Cl. 384-21.000.

Wojcik, Thadeus H., to Thomas Regout N.V. Telescopic rail with locking mechanism. 5,181,782, Cl. 384-21.000.

Wolf, Gerhard D.: *See*—
Giesecke, Henning; Wolf, Gerhard D.; Muller, Hanns P.; von Gizycki, Ulrich; and Wienkenhover, Martin, 5,182,135, Cl. 427-98.000.

Wolf, Peter: *See*—
Connell, John W.; Hergenrother, Paul M.; and Wolf, Peter, 5,182,356, Cl. 528-128.000.

Wolfbeis, Otto S.: *See*—
Kessler, Manfred; and Wolfbeis, Otto S., 5,182,214, Cl. 436-88.000.

Wolfeil, Frank: *See*—
Rontey, Daniel C.; Bigando, Donald; and Wolfeil, Frank, 5,182,417, Cl. 102-204.000.

Wolff, Guenter, to Robert Bosch GmbH. Pressure switch valve, for hydraulic vehicle brake systems with traction control (ASR). 5,181,768, Cl. 303-84.200.

Wolff Walsrode Aktiengesellschaft: *See*—
Breckwoldt, Jorn; and Szablikowski, Klaus, 5,182,380, Cl. 536-90.000.

Wolfgarten, Achim: *See*—
Vente, Paul; and Wolfgarten, Achim, 5,181,856, Cl. 439-125.000.

Wollard, Douglas J., to A.B Ingredients Ltd. Electrostatic spray apparatus. 5,181,661, Cl. 239-704.000.

Wollert, Gary S.: *See*—
Braun, Robert D.; Crass, Matthew M.; Piehl, James R.; Schend, David J.; Wollert, Gary S.; Mueckl, Jerry W.; and Becker, Thomas P., 5,182,512, Cl. 324-175.000.

Wolter, Heinz. Locking device consisting of key and locking cylinder. 5,181,406, Cl. 70-337.000.

Wong, James, to Composite Materials Technology, Inc. Extruded wires having layers of superconducting alloy and refractory meal encased in a normal metal sheath. 5,182,176, Cl. 428-930.000.

Wong, Yiu-Huen: *See*—
Blonder, Greg E.; Cappuzzo, Mark A.; Clark, Harold R.; Scotti, Ronald E.; and Wong, Yiu-Huen, 5,182,787, Cl. 385-131.000.

Woodbridge, Donald A.: *See*—
Johnson, Allan H.; and Woodbridge, Donald A., 5,182,449, Cl. 250-227.140.

Woods, James L.; and Thomasino, Robert F. Folding void filler. 5,181,814, Cl. 410-122.000.

Woodworth, George K.; and Smith, Forrest K., to Techmatics, Inc. High speed transfer switch. 5,182,464, Cl. 307-87.000.

Wright, Bruce A. Pedi pan. 5,181,613, Cl. 206-567.000.

Wright, Deann K.: *See*—
Manos, M. Michele; Wright, Deann K.; and Ting, Yi, 5,182,377, Cl. 536-24.320.

Wright, Michael E., to National Semiconductor Corp. Current source whose output increases as control voltages are balanced. 5,182,462, Cl. 307-43.000.

Wu, Chengjiu; Mooring, Anne; and Yardley, James T., to Hoechst Celanese Corporation. Deep u.v. photoresist compositions containing 4-tert-butylstyrene/maleimide copolymer and polycyclic cyclopentane-2-diazo-1,3-dione and elements utilizing the compositions. 5,182,185, Cl. 430-165.000.

Wu, Chung-Yu: *See*—
Ker, Ming-Dou; Lee, Chung-Yuan; and Wu, Chung-Yu, 5,182,220, Cl. 437-34.000.

Wu, Shanliang: *See*—
Wang, Ren; Wu, Shanliang; and Zhang, Zhigang, 5,182,249, Cl. 502-303.000.

Wu, Wen-Yen. Card lock and a punchable key card. 5,181,407, Cl. 70-361.000.

Wuelknitz, Peter; Lehmann, Rudolf; and Klueppel, Hans-Juergen, to Henkel Kommanditgesellschaft auf Aktien. Anti-plaque toothpaste. 5,182,101, Cl. 424-54.000.

Wunnenberg, Wolfgang: *See*—
Weber, Raymond; and Wunnenberg, Wolfgang, 5,181,633, Cl. 222-195.000.

Wychowski, Czeslaw: *See*—
Girard, Marc; Wychowski, Czeslaw; and Martin, Annette, 5,182,211, Cl. 435-320.100.

Wynn's Climate Systems, Inc.: *See*—
Abraham, Anthony W., 5,181,388, Cl. 62-77.000.

Wysong, Douglas E.; and Bedel, Joseph A., to Finn Corporation. Apparatus for conveying and discharging bulk materials. 5,181,804, Cl. 406-67.000.

X-Cyte Inc.: *See*—
Nysen, Paul A.; and Nagel, Jon L., 5,182,570, Cl. 343-795.000.

Xerox Corporation: *See*—
Mayo, James D.; Duff, James M.; Bluhm, Terry L.; and Hsiao, Cheng K., 5,182,382, Cl. 540-141.000.

XOMOX International GmbH & Co.: *See*—
Gonsior, Wolfgang, 5,181,690, Cl. 251-172.000.

Yabe, Masao: *See*—
Inagaki, Yoshio; Adachi, Keiichi; and Yabe, Masao, 5,182,186, Cl. 430-270.000.

Yachigo, Shinichi: *See*—
Sagawa, Seiji; Kano, Toshio; Yachigo, Shinichi; and Ida, Kanako, 5,182,390, Cl. 544-222.000.

Yagasaki, Toshiaki: *See*—
Masuda, Shunichi; Shimizu, Katsuichi; Yagasaki, Toshiaki; and Sakamaki, Hisashi, 5,182,597, Cl. 355-205.000.

Yagi, Eiichiro: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Yagi, Juzo: *See*—
Taniguchi, Masato; Yagi, Juzo; and Takeda, Hiroshi, 5,181,691, Cl. 251-315.000.

Yaguchi, Bunsho: *See*—
Ashikawa, Noboru; Yaguchi, Bunsho; Yasuda, Toyoshi; Takano, Masami; Ohhashi, Akihito; Shimada, Hiroyuki; and Akioka, Masahiro, 5,181,893, Cl. 475-203.000.

Yahata, Yoshio: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Yajima, Koichi: *See*—
Hirose, Kazunori; Hashimoto, Shinya; and Yajima, Koichi, 5,181,973, Cl. 148-302.000.

Yamada, Hideaki: *See*—
Kise, Shoichi; Hayashida, Mikio; Ori, Aiichiro; Hiratsuka, Junzou; and Yamada, Hideaki, 5,182,198, Cl. 435-126.000.

Yamada, Koichiro: *See*—
Nakai, Hideo; Yamada, Koichiro; Nomura, Shumihiro; Matsumoto, Mamoru; and Iwata, Hiroshi, 5,182,296, Cl. 514-376.000.

Yamada, Koji: *See*—
Hiramatsu, Akinori; Okamoto, Futoshi; Kido, Hiroshi; Sako, Hiroyuki; Yamanaka, Yukio; and Yamada, Koji, 5,182,702, Cl. 363-132.000.

Yamada, Masato; Shirakawa, Junji; and Uno, Kazuo, to Hitachi Koki Co. Ltd. Xerographic printing machine with an improved transfer unit. 5,182,605, Cl. 355-274.000.

Yamada, Takanobu, to Minolta Camera Kabushiki Kaisha. Separation charger control for electro-photographic apparatus. 5,182,603, Cl. 355-273.000.

Yamaga, Kenichi: *See*—
Sakata, Kazunari; Ishii, Katsumi; and Yamaga, Kenichi, 5,181,819, Cl. 414-217.000.

Yamagata, Hisao: *See*—
Sakata, Shigekazu; Ito, Yasuo; Ochiai, Kunio; and Yamagata, Hisao, 5,182,748, Cl. 370-94.100.

Yamagishi, Toshio; Kimura, Youichi; Shuto, Tamotsu; and Ito, Tatuya, to Sharp Kabushiki Kaisha. Document feeder with adjustable length document reversing transport path. 5,181,714, Cl. 271-186.000.

Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, to Eisai Co., Ltd. Diphenylethylene derivatives pharmaceutical compositions containing same and treatment methods. 5,182,301, Cl. 514-539.000.

Yamagiwa, Hiroshi: *See*—
Yamate, Kazunori; Kinoshita, Hideo; Uenishi, Chikara; Ugajin, Masafumi; Kidokoro, Shinichi; and Yamagiwa, Hiroshi, 5,182,497, Cl. 315-383.000.

Yamaguchi, Katsuya: *See*—
Takahashi, Mitsuhiko; Miyata, Hirofumi; Yuki, Shinya; Nonaka, Keizo; Nakano, Yoshihisa; Mitsuhashi, Hiroshi; Yamaguchi, Katsuya; and Yoshida, Yasuhiko, 5,181,888, Cl. 474-101.000.

Yamaguchi, Kentoku; and Sato, Kenichi, to Kabushiki Kaisha Toshiba. Telephone set having a volatile memory. 5,182,769, Cl. 379-387.000.

Yamaguchi, Kojiro: *See*—
Iwafune, Seiichiro; Yamaguchi, Kojiro; Takiguchi, Eiji; and Iwata, Toshiro, 5,181,976, Cl. 152-209.00R.

Yamaha Corporation: *See*—
Kunimoto, Toshifumi, 5,182,415, Cl. 84-660.000.
Yamazaki, Shohei, 5,182,681, Cl. 360-70.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Motoyama, Yu; and Katoh, Ryusuke, 5,181,493, Cl. 123-431.000.

Yamakoshi, Yukiyoshi: *See*—
Takei, Hajime; Yamakoshi, Yukiyoshi; Matsuda, Naoyuki; Moro, Fuminori; Tomita, Hiroshi; and Sano, Homare, 5,181,707, Cl. 271-20.000.

Yamamoto, Akira; Kimura, Shigeo; Kusaka, Kensaku; Maruta, Hidekazu; and Adachi, Hiroyuki, to Canon Kabushiki Kaisha. Image fixing apparatus. 5,182,606, Cl. 355-289.000.

Yamamoto, Hiranaga; Takata, Souichi; Wakuda, Osamu; and Namba, Toyoaki, to Sharp Kabushiki Kaisha. Sheet feeding apparatus that uses a variable vacuum surface and timer to achieve a duplicate feed preventive function. 5,181,706, Cl. 271-11.000.

Yamamoto, Keisuke: *See*—
Kishi, Fumio; Akaike, Masatake; Yamamoto, Keisuke; Motoi, Taiko; Kaneko, Norio; Iwatate, Fujio; Ohmi, Kazuaki; Kawasaki, Takehiko; and Shinjou, Atsuko, 5,182,253, Cl. 505-1.000.

Yamamoto, Masanori; Nakayama, Toshio; Fujii, Osamu; and Okabe, Rie, to House Food Industrial Co., Ltd. Pyrimine-producing bacteria. 5,182,206, Cl. 435-253.300.

Yamamoto, Naoki; Mukai, Nobuhiro; Ige, Hitoshi; and Atarashi, Junko, to Mitsubishi Rayon Co., Ltd. Dental composition. 5,182,332, Cl. 525-305.000.

Yamamoto, Nobuo. Method and apparatus of two-degrees-of-freedom time difference comparison compensator. 5,182,703, Cl. 364-148.000.

Yamamoto, Tadashi; Seno, Takao; and Shiota, Shuichiro, to Chugai Ro Company, Limited. Line for continuously annealing and pickling stainless steel strip. 5,182,002, Cl. 204-210.000.

Yamamoto, Takeshi: *See*—
Tomiyasu, Hiroshi; Kobayashi, Yoshiko; Goto, Kiyoshi; Yamamoto, Takeshi; and Nakai, Hideyuki, 5,182,183, Cl. 430-165.000.

Yamamoto, Toshihiro; Kimura, Masao; and Saito, Keiichi, to Nippon Steel Chemical Co., Ltd.; and Nippon Steel Corp. Molding materials. 5,182,352, Cl. 526-329.200.

Yamamoto, Yoshinori: *See*—
Miyake, Akira; and Yamamoto, Yoshinori, 5,182,153, Cl. 428-64.000.

Yamamoto, Yuushin; Sashida, Nobuo; Yamasaki, Yuuko; and Kawabata, Takao, to Mitsubishi Denki Kabushiki Kaisha. 3-Phase converter apparatus. 5,182,463, Cl. 307-46.000.

Yamanaka, Yukio: *See*—
Hiramatsu, Akinori; Okamoto, Futoshi; Kido, Hiroshi; Sako, Hiroyuki; Yamanaka, Yukio; and Yamada, Koji, 5,182,702, Cl. 363-132.000.

Yamanouchi, Yasuhiro: *See*—
Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, 5,182,140, Cl. 427-230.000.

Yamasaki, Haruki, to Tanaka Kikinzoku Kogyo K.K. Electrode for human heart pacemaker. 5,181,526, Cl. 128-784.000.

Yamasaki, Richard G.; and De Veirman, Geert A., to Silicon Systems, Inc. Bipolar tunable transconductance element. 5,182,477, Cl. 307-494.000.

Yamasaki, Yuuko: *See*—
Yamamoto, Yuushin; Sashida, Nobuo; Yamasaki, Yuuko; and Kawabata, Takao, 5,182,463, Cl. 307-46.000.

Yamashita, Hiromi, to Mitsubishi Denki Kabushiki Kaisha. Contact type line image sensor. 5,182,445, Cl. 250-208.100.

Yamashita, Keitaro; and Ogura, Eiji, to Sony Corporation. Recording control system. 5,182,680, Cl. 360-60.000.

Yamashita, Yohachi: *See*—
Handa, Kiyoji; Mukaeda, Satoshi; Kanai, Hideyuki; Yamashita, Yohachi; Furukawa, Osamu; and Harata, Mitsuo, 5,182,695, Cl. 361-321.000.

Yamate, Kazunori; Kinoshita, Hideo; Uenishi, Chikara; Ugajin, Masafumi; Kidokoro, Shinichi; and Yamagiwa, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Cathode clamping circuit apparatus with digital control. 5,182,497, Cl. 315-383.000.

Yamatsu, Isao: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.

Yamauchi, Hiroshige; Ogasawara, Takashi; and Takahashi, Tomotsugu, to Oji Paper Co., Ltd. Electrostatic recording material. 5,182,159, Cl. 428-192.000.

Yamazaki, Kazumasa: *See*—
Tanabe, Hiroto; and Yamazaki, Kazumasa, 5,181,974, Cl. 148-320.000.

Yamazaki, Makoto: *See*—
Ozaki, Masahide; Uji, Masanori; Yamazaki, Makoto; and Ito, Tatsuo, 5,181,305, Cl. 29-408.000.

Yamazaki, Masachika: *See*—
Suzuki, Masato; Inaba, Hiromi; Takenaga, Hiroshi; Yamazaki, Masachika; Oonuma, Naoto; Nakamura, Kiyoshi; Sakai, Yoshio; Yoneda, Kenji; Nakata, Naofumi; and Kasai, Syoji, 5,182,776, Cl. 382-14.000.

Yamazaki, Masayuki: *See*—
Yoshioka, Osami; Matsui, Naoki; Sato, Hiroaki; Omori, Kouji; Yamazaki, Masayuki; Suzuki, Masafumi; Oishi, Hitoshi; Kitagawa, Naoto; Seike, Takaya; and Araki, Yasuhiro, 5,182,074, Cl. 266-87.000.

Yamazaki, Shohei, to Yamaha Corporation. Rotating head magnetic recording and reproducing device having automatic tracking control function. 5,182,681, Cl. 360-70.000.

Yamazaki, Shoichi: *See*—
Kitagishi, Nozomu; and Yamazaki, Shoichi, 5,182,671, Cl. 359-557.000.

Yanaba, Shigeru; Shiobara, Masataka; Masamizu, Koji; Morohara, Kiyoshi; and Abe, Seiji, to Lion Corporation. Zeolite containing liquid detergent composition. 5,182,044, Cl. 252-174.240.

Yanagi, Shigenori, to Fujitsu Limited. Deceleration control system for positioning an optical head in an optical disk unit. 5,182,736, Cl. 369-32.000.

Yanagisawa, Yoshihiro; Sakai, Kunihiro; Takamatsu, Osamu; Eguchi, Ken; Matsuda, Hiroshi; Kawade, Hisaaki; and Takeda, Toshihiko, to Canon Kabushiki Kaisha. Information processing method and information processing device. 5,182,724, Cl. 365-151.000.

Yanagishita, Norio, to Ikeda Bussan Co., Ltd. Method of manufacturing skin cover for seat. 5,181,980, Cl. 156-93.000.

Yang, Duck J.: *See*—
Antonelli, Joseph A.; Lin, Tyau-Jeen; Yang, Duck J.; and Yasuda, Hirotsugu, 5,182,000, Cl. 204-181.100.

Yang, Huei-hsiung: *See*—
Johnson, Eric A.; Schreiber, David; Ho, Kwok P.; Hall, William T.; Yang, Huei-hsiung; and Geldiay-Tuncer, Beril, 5,182,208, Cl. 435-254.000.

Yano, Masaru: *See*—
Iwai, Noriyuki; Sasaki, Kimito; Yano, Masaru; Wakimoto, Fumiyoshi; Tokunaga, Wataru; and Shirakura, Masaru, 5,182,676, Cl. 359-841.000.

Yano, Shinsuke: *See*—
Hirai, Takami; and Yano, Shinsuke, 5,182,240, Cl. 501-139.000.

Yanyo, Lynn C.: *See*—
Holmes-Farley, Stephen R.; and Yanyo, Lynn C., 5,182,143, Cl. 427-409.000.

Yardley, James T.: *See*—
Wu, Chengjiu; Mooring, Anne; and Yardley, James T., 5,182,185, Cl. 430-165.000.

Yasuda, Go; and Wada, Akira, to Nisshinbo Industries, Inc. Method of vibration-molding friction member. 5,182,061, Cl. 264-72.000.

Yasuda, Hirotsugu: *See*—
Antonelli, Joseph A.; Lin, Tyau-Jeen; Yang, Duck J.; and Yasuda, Hirotsugu, 5,182,000, Cl. 204-181.100.

Yasuda, Toyoshi: *See*—
Ashikawa, Noboru; Yaguchi, Bunsho; Yasuda, Toyoshi; Takano, Masami; Ohhashi, Akihito; Shimada, Hiroyuki; and Akioka, Masahiro, 5,181,893, Cl. 475-203.000.

Yasui, Toshihiko, to Shimano, Inc. Fixed guide mounting structure. 5,181,336, Cl. 43-24.000.

Yasuki, Seijiro: *See*—
Kimata, Yoshihide; Yasuki, Seijiro; Ogawa, Yoshihiko; and Kawai, Kiyoyuki, 5,182,644, Cl. 358-140.000.

Yasumoto, Mitsugi: *See*—
Suzuki, Masahiro; Nozaki, Kenji; Kajitani, Makoto; Yasumoto, Mitsugi; Ono, Naohiko; and Shindo, Takashi, 5,182,284, Cl. 514-255.000.

Yeh, Tse-Huei; Tsai, Song-Jau; Lin, Chang-Tsun; Liao, Long-Gee; and Huang, Tsai-Sheng, to China Steel Corp., Ltd. Method of measuring and compensating roll eccentricity of a rolling mill. 5,181,408, Cl. 72-11.000.

Yiannikouros, George P.; and Manchand, Percy S., to Hoffmann-La Roche Inc. Process for precursors to calcitriol and related compounds. 5,182,393, Cl. 549-4.000.

Ying, Shao-Yao: *See*—
Ling, Nicholas C. K.; Ueno, Naoto; Shimasaki, Shunichi; Esch, Frederick S.; Ying, Shao-Yao; and Guillemin, Roger C. L., 5,182,375, Cl. 536-23.500.

Yokomachi, Naoya: *See*—
Ikeda, Hayato; Fujii, Toshiro; Yokomachi, Naoya; and Takemoto, Shoji, 5,181,834, Cl. 417-269.000.

Yokoyama, Hiroyuki: *See*—
Nakane, Toshihiko; Koishi, Masumi; Fukui, Hiroshi; Okunuki, Yutaka; Yahata, Yoshio; Kumagai, Shigenori; Yokoyama, Hiroyuki; Yagi, Eiichiro; Fukuda, Minoru; Ohta, Tadao; Kanda, Fujihiro; Ohno, Kazuhisa; Ebisawa, Toshihide; Nanba, Tomiyuki; Takada, Susumu; Hatao, Masato; Suetsugu, Masaru; Tanaka, Toshihiro; and Moro, Osamu, 5,182,103, Cl. 424-78.030.

Yokoyama, Ikuo, to Asahi Yukizai Kogyo Co., Ltd. Ball valve. 5,181,539, Cl. 137-625.320.

Yokoyama, Kenji: *See*—
Koga, Keiji; Satoh, Jun-ichi; Yokoyama, Kenji; Nisizawa, Akinori; and Tokuoka, Yasumichi, 5,182,693, Cl. 360-135.000.

Yokoyama, Shigeki; Sato, Tadahisa; Kimura, Keizo; Furutachi, Nobuo; and Takahashi, Osamu, to Fuji Photo Film Co., Ltd. Pyrazoloazoleazomethine dyes. 5,182,339, Cl. 525-242.000.

Yokozeki, Akimichi: *See*—
Bartlett, Philip L.; Bivens, Donald B.; Lunger, Brooks S.; and Yokozeki, Akimichi, 5,182,040, Cl. 252-67.000.

Yoneda, Kenji: *See*—
Suzuki, Masato; Inaba, Hiromi; Takenaga, Hiroshi; Yamazaki, Masachika; Oonuma, Naoto; Nakamura, Kiyoshi; Sakai, Yoshio; Yoneda, Kenji; Nakata, Naofumi; and Kasai, Syoji, 5,182,776, Cl. 382-14.000.

Yonemoto, Kazuya: *See*—
Iizuka, Tetsuya; Yonemoto, Kazuya; Wada, Kazushi; Nakamura, Satoshi; and Harada, Koichi, 5,182,622, Cl. 257-231.000.

Yoneyama, Yoshito; Toge, Yoshiyuki; and Yuguchi, Naoki, to Canon Kabushiki Kaisha. Sample supply device and sample inspection apparatus using the device. 5,182,617, Cl. 356-440.000.

Yonezawa, Keitaro, to Kabushiki Kaisha KOSMEK. Clamping apparatus. 5,181,700, Cl. 269-24.000.

Yonezawa, Keitaro, to Kabushiki Kaisha KOSMEK. Hydraulic clamp. 5,181,701, Cl. 269-32.000.

Yoo, Young S.; and Salmon, John K., to Otis Elevator Company. Noise and vibration reduction at elevator cab hitch. 5,181,586, Cl. 187-1.00A.

Yorozu, Hidenori: *See*—
Takata, Noboru; Arai, Junko; and Yorozu, Hidenori, 5,182,105, Cl. 424-78.020.

Yoshida, Akihiko: *See*—
Mizuno, Yasuo; Ikeda, Masaki; and Yoshida, Akihiko, 5,181,947, Cl. 65-2.000.

Yoshida Kogyo K. K.: *See*—
Horita, Yoshiyuki; Ishii, Susumu; and Takizawa, Toshiaki, 5,181,298, Cl. 24-429.000.

Yoshida Kogyo K.K.: *See*—
Ozaki, Masahide; Uji, Masanori; Yamazaki, Makoto; and Ito, Tatsuo, 5,181,305, Cl. 29-408.000.
Sugitani, Yoshihisa; and Matsubara, Isamu, 5,181,825, Cl. 414-786.000.

Yoshida, Mitsuhiro: *See*—
Kobayashi, Takaichi; and Yoshida, Mitsuhiro, 5,182,699, Cl. 361-395.000.

Yoshida, Shigeo: *See*—
Inoue, Naoshi; Yoshida, Shigeo; and Sugino, Toshio, 5,182,650, Cl. 358-296.000.

Yoshida, Yasuhiko: *See*—
Takahashi, Mitsuhiko; Miyata, Hirofumi; Yuki, Shinya; Nonaka, Keizo; Nakano, Yoshihisa; Mitsuhashi, Hiroshi; Yamaguchi, Katsuya; and Yoshida, Yasuhiko, 5,181,888, Cl. 474-101.000.

Yoshida, Yoshihiro, to Kabushiki Kaisha Toshiba. Hysteresis comparator. 5,182,471, Cl. 307-355.000.

Yoshikawa, Kikuo, to Canon Kabushiki Kaisha. Objective lens actuator using a balance weight therein. 5,182,738, Cl. 369-44.140.

Yoshimi, Tomohisa; Iwama, Shinji; Kajino, Yuuichi; and Sugi, Hikaru, to Nippondenso Co., Ltd. Sunshine sensor and air conditioner for vehicle. 5,181,654, Cl. 236-91.00C.

Yoshimura, Hiroyuki: *See*—
Yamagishi, Youji; Akasaka, Kozo; Suzuki, Takeshi; Miyamoto, Mitsuaki; Nakamoto, Kouji; Okano, Kazuo; Abe, Shinya; Ikuta, Hironori; Hayashi, Kenji; Yoshimura, Hiroyuki; Fujimori, Tohru; Harada, Koukichi; and Yamatsu, Isao, 5,182,301, Cl. 514-539.000.

Yoshimura, Koji: *See*—
Nakahama, Kazuo; Kaisho, Yoshihiko; and Yoshimura, Koji, 5,182,195, Cl. 435-69.100.

Yoshioka, Kiyoharu; and Arai, Koji, to Canon Kabushiki Kaisha. Color facsimile apparatus. 5,182,637, Cl. 358-75.000.

Yoshioka, Osami; Matsui, Naoki; Sato, Hiroaki; Omori, Kouji; Yamazaki, Masayuki; Suzuki, Masafumi; Oishi, Hitoshi; Kitagawa, Naoto; Seike, Takaya; and Araki, Yasuhiro, to NKK Corporation. Apparatus for continuously cooling metal strip. 5,182,074, Cl. 266-87.000.

Young, John D.; Hedengren, Kristina H.; and Hurley, Donna C., to General Electric Company. Method and apparatus for a multi-channel multi-frequency data acquisition system for nondestructive eddy current inspection testing. 5,182,513, Cl. 324-232.000.

Youngman, Brian A.: *See*—
Frenzel, James F., III; and Youngman, Brian A., 5,182,747, Cl. 370-85.500.

Yuasa, Eiji: *See*—
Matsuzawa, Shigeji; Yuasa, Eiji; Tanaka, Junichiro; and Nakamura, Teruo, 5,182,138, Cl. 427-157.000.

Yuge, Noriyoshi; Baba, Hiroyuki; and Aratani, Fukuo, to Kawasaki Steel Corporation. Method and apparatus for purifying silicon. 5,182,091, Cl. 423-348.000.

Yuge, Shizuo: *See*—
Hara, Yoshinobu; Yuge, Shizuo; and Hara, Kazuyoshi, 5,182,598, Cl. 355-208.000.

Yuguchi, Naoki: *See*—
Yoneyama, Yoshito; Toge, Yoshiyuki; and Yuguchi, Naoki, 5,182,617, Cl. 356-440.000.

Yuki, Shinya: *See*—
Takahashi, Mitsuhiko; Miyata, Hirofumi; Yuki, Shinya; Nonaka, Keizo; Nakano, Yoshihisa; Mitsuhashi, Hiroshi; Yamaguchi, Katsuya; and Yoshida, Yasuhiko, 5,181,888, Cl. 474-101.000.

Yurick, Michael R. Hoisting cage with interior truss design. 5,181,756, Cl. 294-68.100.

Yuyama, Junpei: *See*—
Goto, Eiichi; Geng, Qiquan; and Yuyama, Junpei, 5,181,383, Cl. 62-6.000.

Zabriskie, John B.: *See*—
Hall, William W.; Read, Stanley E.; Lyons, Michael; and Zabriskie, John B., 5,182,306, Cl. 514-629.000.
Zachry, Woodie M., Jr., to Encon Safety Products. Strap retainer. 5,181,280, Cl. 2-452.000.
Zaiser, Wolfgang; Merkle, Hans; Wagner, Gerhard; and Spengler, Gerhard, to Mercedes-Benz AG. Automatic shifting device of a multi-path toothed-wheel gear change box. 5,181,431, Cl. 74-333.000.
Zalisz, Rene: *See*—
Smets, Pierre; and Zalisz, Rene, 5,182,378, Cl. 536-4.100.
Zander, Claus-Peter: *See*—
Merkel, Gerd; Vogt, Wilfried; Glaunsinger, Georg; Stadler, Peter; Zander, Claus-Peter; Maass, Jurgen; Schmitt, Gernot; Necker, Thomas; and Becker, Willi, 5,181,469, Cl. 101-415.100.
Zanke, Dieter: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 5,182,277, Cl. 514-231.200.
Zecchini, Franco, to Fini Electtrocostruzioni Meccaniche S.p.A. Engine compressor with a perfected ventilating device. 5,181,840, Cl. 417-364.000.
Zeidler, Georg: *See*—
Derber, Bernd; Hansen, Guenter; Reichelt, Helmut; Vamvakaris, Christos; and Zeidler, Georg, 5,182,372, Cl. 534-857.000.
Zeitlin, Eric S. Beverage fanning device. 5,181,836, Cl. 417-313.000.
Zellweger Uster AG: *See*—
Aeppli, Kurt, 5,181,374, Cl. 57-264.000.
Zembrowski, William J.: *See*—
Mylari, Banavara L.; and Zembrowski, William J., 5,182,391, Cl. 544-236.000.
Zenon Environmental Inc.: *See*—
Cote, Pierre L.; Maurion, Roger P.; Lipski, Christopher J.; and Pedersen, Steven K., 5,182,019, Cl. 210-321.800.
Zentralinstitut fur Optik und Spektroskopie: *See*—
Florek, Stefan; Guther, Reiner; and Becker-Ross, Helmut, 5,182,609, Cl. 356-328.000.
Zeppezauer, Michael; and Reichhart, Robert, to Rusch, Volker. Use of pure histones H1 and H2A:H2B dimers in therapeutic methods. 5,182,257, Cl. 514-2.000.
Zexel Corporation: *See*—
Okano, Masami; and Takeuchi, Kunihiro, 5,182,459, Cl. 307-10.100.
Teraya, Takanori, 5,181,831, Cl. 417-222.00S.
Zhang, Zhigang: *See*—
Wang, Ren; Wu, Shanliang; and Zhang, Zhigang, 5,182,249, Cl. 502-303.000.
Zielske, Alfred G.: *See*—
Rowland, Richard R.; Fong, Ronald A.; Wiersema, Richard J.; and Zielske, Alfred G., 5,182,045, Cl. 252-186.380.
Zimmer, Inc.: *See*—
Houston, Michelle L.; and Greig, Kevin M., 5,181,925, Cl. 623-20.000.
Zirconium Technology Corporation: *See*—
Sharif, Sharif, 5,182,408, Cl. 556-55.000.
Zobkiw, Christopher P.: *See*—
Shen, Michael C. S.; and Zobkiw, Christopher P., 5,182,728, Cl. 367-7.000.
Zollfrank, Gerlinde: *See*—
Strumpf, Thomas; Lyr, Horst; Zanke, Dieter; Zollfrank, Gerlinde; Oros, Gyula; Viranyi, Ferenc; and Ersek, Tibor, 5,182,277, Cl. 514-231.200.
Zona, Mauro; and Bettinardi, Marco, to Comau SpA. Arrangement for the electrical cables of an articulated robot arm. 5,181,591, Cl. 191-12.00R.
Zook, Gerald P. Medicating device for nails and adjacent tissue. 5,181,914, Cl. 604-307.000.
Zumbe, Albert: *See*—
Blaser, Eric; and Zumbe, Albert, 5,182,114, Cl. 424-673.000.
Zuta, Marc, to Ilatron Ltd. Frequency synthesizer having microcomputer supplying analog and digital control signals to VCO. 5,182,528, Cl. 331-1.00A.
3D Systems, Inc.: *See*—
Allison, Joseph W.; Richter, Jan; Childers, Craig M.; Smalley, Dennis R.; Hull, Charles W.; and Jacobs, Paul F., 5,182,055, Cl. 264-22.000.
Spence, Stuart T.; and Smalley, Dennis R., 5,182,056, Cl. 264-22.000.
Vorgitch, Thomas J.; Bradford, Raymond A.; Floyd, Grady O.; Tarnoff, Harry L.; Vinson, Wayne A.; Little, Frank F.; Harlow, Richard A.; Schwarzinger, Wolfgang; Marygold, Paul H.; Lewis, Mark A.; Uziel, Yehoram; Modrek, Borzo; Pitlak, Robert T.; and Chen, Thomas P., 5,182,715, Cl. 364-474.240.
372604 B.C. Ltd.: *See*—
Simmonds, S. Neil, 5,182,509, Cl. 320-14.000.
461844 Ontario Limited: *See*—
Plant, Rex B.; and Marton, John P., 5,181,458, Cl. 99-538.000.
501 Amlite Corporation: *See*—
Allen, Harold O., 5,182,137, Cl. 427-138.000.
501 Nippon Polyurethane Industry Co., Ltd.: *See*—
Tani, Kensuke; and Tonomura, Yoshiaki, 5,182,314, Cl. 521-160.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF JANUARY, 1993

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Arai, Takuya: *See—*
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, Re. 34,168, Cl. 354-145.100.

Asano, Seiji: *See—*
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, Re. 34,168, Cl. 354-145.100.

Bacon, James I.: *See—*
Osburn, Michael L.; Hemsky, Robert L.; and Bacon, James I., Re. 34,169, Cl. 358-27.000.

ColorGraphics Systems, Inc.: *See—*
Osburn, Michael L.; Hemsky, Robert L.; and Bacon, James I., Re. 34,169, Cl. 358-27.000.

Davco Manufacturing Corporation: *See—*
Davis, Leland L., Re. 34,166, Cl. 123-557.000.

Davis, Leland L., to Davco Manufacturing Corporation. Fuel processor apparatus for diesel engine powered vehicles. Re. 34,166, Cl. 123-557.000.

Fuji Photo Film Co., Ltd.: *See—*
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, Re. 34,168, Cl. 354-145.100.

Haishi, Akira: *See—*
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, Re. 34,168, Cl. 354-145.100.

Hara, Hiroshi: *See—*
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, Re. 34,168, Cl. 354-145.100.

Hemsky, Robert L.: *See—*
Osburn, Michael L.; Hemsky, Robert L.; and Bacon, James I., Re. 34,169, Cl. 358-27.000.

Kozai, Katsuya: *See—*
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, Re. 34,168, Cl. 354-145.100.

Mattsson, Michael; and Tunell, Lars-Erik, to Santrade Limited. Drill bit and roller cutter for said drill bit. Re. 34,167, Cl. 175-57.000.

Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, to Fuji Photo Film Co., Ltd. Lens-fitted photographic film package. Re. 34,168, Cl. 354-145.100.

Osburn, Michael L.; Hemsky, Robert L.; and Bacon, James I., to ColorGraphics Systems, Inc. Phase responsive composite video signal control system. Re. 34,169, Cl. 358-27.000.

Santrade Limited: *See—*
Mattsson, Michael; and Tunell, Lars-Erik, Re. 34,167, Cl. 175-57.000.

Takagi, Junichi: *See—*
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, Re. 34,168, Cl. 354-145.100.

Tobioka, Takashi: *See—*
Ohmura, Hiroshi; Arai, Takuya; Haishi, Akira; Kozai, Katsuya; Hara, Hiroshi; Tobioka, Takashi; Asano, Seiji; and Takagi, Junichi, Re. 34,168, Cl. 354-145.100.

Tunell, Lars-Erik: *See—*
Mattsson, Michael; and Tunell, Lars-Erik, Re. 34,167, Cl. 175-57.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Atlantic Scientific Corporation: *See—*
Bent, Rodney B.; and Casper, Paul W., B1 4,543,580, Cl. 342-460.000.
Bent, Rodney B.; and Casper, Paul W., B1 4,792,806, Cl. 342-465.000.

Bent, Rodney B.; and Casper, Paul W., to Atlantic Scientific Corporation. System for lightning ground stroke position by time of arrival discrimination. B1 4,543,580, 1-26-93, Cl. 342-460.000.

Bent, Rodney B.; and Casper, Paul W., to Atlantic Scientific Corporation. Lightning position and tracking method. B1 4,792,806, 1-26-93, Cl. 342-465.000.

Casper, Paul W.: *See—*
Bent, Rodney B.; and Casper, Paul W., B1 4,543,580, Cl. 342-460.000.
Bent, Rodney B.; and Casper, Paul W., B1 4,792,806, Cl. 342-465.000.

Catalysts & Chemicals Industries Co., Ltd.: *See—*
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.

Chambers, James F., to Grove Valve and Regulator Company. Dual action ball valve. B1 4,917,354, 1-26-93, Cl. 251-163.000.

Ernst, James; Rogers, George; and Musto, Dominick, to Symtron Systems, Inc. Fire fighting trainer. B1 4,861,270, 1-26-93, Cl. 434-226.000.

Fukuda, Morio: *See—*
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.

Golembiski, Francis H. Purge valve assembly. B1 5,056,559, 1-26-93, Cl. 137-595.000.

Grove Valve and Regulator Company: *See—*
Chambers, James F., B1 4,917,354, Cl. 251-163.000.

Hanada, Masayuki: *See—*
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.

Hitachi, Ltd.: *See—*
Yamaguchi, Hiroshi; Shimase, Akira; Miyauchi, Tateoki; and Hongo, Mikio, B1 4,609,809, Cl. 219-121.350.

Hongo, Mikio: *See—*
Yamaguchi, Hiroshi; Shimase, Akira; Miyauchi, Tateoki; and Hongo, Mikio, B1 4,609,809, Cl. 219-121.350.

Idaho Research Foundation: *See—*
Maki, Gary K.; and Whitaker, Sterling R., B1 4,912,348, Cl. 307-465.000.

Iida, Kozo: *See—*
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.

Imanari, Makoto: *See—*
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.

Integrated Device Technology, Inc.: *See—*
Leung, Wingyu; and Lee, Winston K. M., B1 4,916,337, Cl. 307-475.000.

International Medical Products, Inc.: *See*—
Shah, Nyan S., B1 4,872,483, Cl. 137-557.000.
Kobayashi, Norihisa: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Koshikawa, Takeo: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Koyanagi, Toshio: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Lee, Winston K. M.: *See*—
Leung, Wingyu; and Lee, Winston K. M., B1 4,916,337, Cl. 307-475.000.
Leung, Wingyu; and Lee, Winston K. M., to Integrated Device Technology, Inc. TTL to CMOS logic level translator. B1 4,916,337, 1-26-93, Cl. 307-475.000.
Maki, Gary K.; and Whitaker, Sterling R., to Idaho Research Foundation. Method for designing pass transistor asychronous sequential circuits. B1 4,912,348, 1-26-93, Cl. 307-465.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Mitsubishi Petrochemical Engineering Co., Ltd.: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Mitsuoka, Shigeaki: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Miyauchi, Tateoki: *See*—
Yamaguchi, Hiroshi; Shimase, Akira; Miyauchi, Tateoki; and Hongo, Mikio, B1 4,609,809, Cl. 219-121.350.
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha; Sakai Chemical Industry Co., Ltd.; Mitsubishi Petrochemical Co., Ltd.; Mitsubishi Petrochemical Engineering Co., Ltd.; and Catalysts & Chemicals Industries Co., Ltd. Adsorbent for arsenic compound and method for removing arsenic compound from combustion gas. B1 4,869,735, 1-26-93, Cl. 55-72.000.
Morii, Atsushi: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Musto, Dominick: *See*—
Ernst, James; Rogers, George; and Musto, Dominick, B1 4,861,270, Cl. 434-226.000.
Nagano, Kiyoshi: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Rikimaru, Hiroaki: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Rogers, George: *See*—
Ernst, James; Rogers, George; and Musto, Dominick, B1 4,861,270, Cl. 434-226.000.
Sakai Chemical Industry Co., Ltd.: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Seto, Touru: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Shah, Nyan S., to International Medical Products, Inc. Conveniently hand held self contained electronic manometer and pressure modulating device. B1 4,872,483, 1-26-93, Cl. 137-557.000.
Shimase, Akira: *See*—
Yamaguchi, Hiroshi; Shimase, Akira; Miyauchi, Tateoki; and Hongo, Mikio, B1 4,609,809, Cl. 219-121.350.
Symtron Systems, Inc.: *See*—
Ernst, James; Rogers, George; and Musto, Dominick, B1 4,861,270, Cl. 434-226.000.
Takatsuka, Hiromu: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.
Weber, Harold J. Direct current power supply. B1 4,300,090, 1-26-93, Cl. 323-311.000.
Whitaker, Sterling R.: *See*—
Maki, Gary K.; and Whitaker, Sterling R., B1 4,912,348, Cl. 307-465.000.
Yamaguchi, Hiroshi; Shimase, Akira; Miyauchi, Tateoki; and Hongo, Mikio, to Hitachi, Ltd. Method and apparatus for correcting delicate wiring of IC device. B1 4,609,809, 1-26-93, Cl. 219-121.350.
Yamauchi, Akihiro: *See*—
Miyazawa, Masaki; Kobayashi, Norihisa; Takatsuka, Hiromu; Morii, Atsushi; Koyanagi, Toshio; Seto, Touru; Iida, Kozo; Mitsuoka, Shigeaki; Rikimaru, Hiroaki; Imanari, Makoto; Koshikawa, Takeo; Yamauchi, Akihiro; Hanada, Masayuki; Fukuda, Morio; and Nagano, Kiyoshi, B1 4,869,735, Cl. 55-72.000.

LIST OF DESIGN PATENTEES

A/S Eccolet Sko: *See*—
Truelsen, Ejnar, 332,690, Cl. D2-320.000.
Abbott Laboratories: *See*—
Hanna, Charles F.; Zurek, Thomas F.; and Khalil, Omar S., 332,834, Cl. D24-223.000.
Albert, Gregory P.: *See*—
Staubitz, Robert B.; Albert, Gregory P.; Dubuque, Kenneth J.; and Vanhorn, Kenneth D., 332,733, Cl. D8-61.000.
Allied Plastics, Inc.: *See*—
Mankey, Neal N., 332,761, Cl. D11-121.000.
Altman, Peter R.; and Shenkal, Yuval, to Altman, Peter R. Illuminated slipper. 332,687, 1-26-93, Cl. D2-265.000.
Altrack Limited: *See*—
Chandler, Graeme A., 332,764, Cl. D12-3.000.
American National Can Company: *See*—
Moloney, Thomas E.; Chernikoff, Nelson N.; Cassidy, Edward K.; and Mann, John M., 332,750, Cl. D9-556.000.
Anderson, George P.: *See*—
Antocci, Joseph D.; and Anderson, George P., 332,835, Cl. D24-224.000.
Antocci, Joseph D.; and Anderson, George P., to Iniziative Marittime 1991, s.r.l. Reagent container. 332,835, 1-26-93, Cl. D24-224.000.
Apple Computer, Inc.: *See*—
Krakower, Jonathan; Ivester, Gavin R.; and Brunner, Robert D., 332,783, Cl. D14-106.000.
Arnott, John: *See*—
Kaga, Gary; and Arnott, John, 332,702, Cl. D6-310.000.
Asano, Eiji; and Iwaki, Yoshiko. Combined decoration ribbon and string. 332,763, 1-26-93, Cl. D11-184.000.
Aset Industrial Co. Ltd.: *See*—
Wang, Gong-Nan; and Chung, Chien-Hsin, 332,778, Cl. D14-102.000.
AST Research, Inc.: *See*—
Toedter, Peter K., 332,781, Cl. D14-106.000.

Aubuchon, David B.; Riebel, Karen J.; and Schaefer, William L., to Figgie International Inc. Warm-up suit. 332,686, 1-26-93, Cl. D2-29.000.

Auld, David J.: *See*—
Royse, Alistair G.; and Auld, David J., 332,855, Cl. D34-19.000.

Australian Medical Technology Pty. Ltd.: *See*—
Royse, Alistair G.; and Auld, David J., 332,855, Cl. D34-19.000.

Autry Industries, Inc.: *See*—
Autry, James C., 332,688, Cl. D2-314.000.

Autry, James C., to Autry Industries, Inc. Athletic shoe upper and sole periphery. 332,688, 1-26-93, Cl. D2-314.000.

Beckner, Frederick L. Combination tool. 332,755, 1-26-93, Cl. D10-69.000.

Beckner, Kenneth W., Jr. Battery powered purse or case light. 332,839, 1-26-93, Cl. D26-37.000.

Beechuk, Timothy J.: *See*—
Reece, John S.; Pardo, John; and Beechuk, Timothy J., 332,748, Cl. D9-528.000.

Belfor, Christine A. Pedestal sink. 332,829, 1-26-93, Cl. D23-292.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Printing ribbon cartridge. 332,795, 1-26-93, Cl. D18-12.000.

Belport Co., Inc.: *See*—
Burridge, Robert E., 332,831, Cl. D23-335.000.

Berti, Enzo, to Libman Company, The. Broom cap. 332,701, 1-26-93, Cl. D4-199.000.

Black & Decker Inc.: *See*—
Torbet, Philip A.; Van Deursen, Gary; and McCloskey, Don R., 332,722, Cl. D7-412.000.

Blimline, Donald. Combined baseball game, score pad, and pen. 332,806, 1-26-93, Cl. D21-28.000.

Bloom, David H., to Cole-Parmer Instrument Company. Support stand. 332,738, 1-26-93, Cl. 78-380.000.

Blyskal, Philip: *See*—
Lauks, Imants R.; Rogers, Joseph W.; Svezia, John; Wieck, Henry J.; Zelin, Michael; Blyskal, Philip; and Demusz, Stephen A., 332,833, Cl. D24-186.000.

Bobrick Washroom Equipment, Inc.: *See*—
Hines, David M., 332,849, Cl. D34-6.000.

Bon Treasure Industrial Co., Ltd.: *See*—
Li, Kim-Hung, 332,804, Cl. D21-13.000.

Bonnell, Thomas A., to Kohler Co. Handle for plumbing fixtures and accessories. 332,823, 1-26-93, Cl. D23-250.000.

Bonnell, Thomas A., to Kohler Co. Handle for plumbing fixtures and accessories. 332,825, 1-26-93, Cl. D23-252.000.

Bridgestone Corporation: *See*—
Tsuda, Toru; and Sasagawa, Toru, 332,767, Cl. D12-147.000.

Bromley, Robert: *See*—
Sedighzadeh, Marty; and Bromley, Robert, 332,714, Cl. D6-513.000.
Sedighzadeh, Marty; and Bromley, Robert, 332,715, Cl. D6-513.000.

Brown, Donald: *See*—
Thomas, Frank W.; and Brown, Donald, 332,757, Cl. D10-114.000.

Brunner, Robert D.: *See*—
Krakower, Jonathan; Ivester, Gavin R.; and Brunner, Robert D., 332,783, Cl. D14-106.000.

Brussing, Bernd, to Hans Friedrich Hefendehl. Compartmentalized trash container. 332,850, 1-26-93, Cl. D34-7.000.

Burgy, Jeff: *See*—
Gauthier, John T.; Scott, Robert P.; Burgy, Jeff; Stoddard, John P.; and Sarre, Robin, 332,790, Cl. D14-299.000.

Burridge, Robert E., to Belport Co., Inc. Heating unit for use in melting and keeping hydrocolloid cartridges in liquid form. 332,831, 1-26-93, Cl. D23-335.000.

C. N. Burman Co.: *See*—
Cohon, Bertram, 332,840, Cl. D26-93.000.

Cameron, Russell J.: *See*—
Reid, Kevin A.; Reid, Karl; and Cameron, Russell J., 332,822, Cl. D23-233.000.

Canstar Sports Group, Inc.: *See*—
Johnston, Robert M., 332,845, Cl. D29-22.000.

Cassidy, Edward K.: *See*—
Moloney, Thomas E.; Chernikoff, Nelson N.; Cassidy, Edward K.; and Mann, John M., 332,750, Cl. D9-556.000.

Cavanaugh, Peter J. Electronic language translator. 332,775, 1-26-93, Cl. D14-100.000.

Chandler, Graeme A., to Altrack Limited. All terrain motor vehicle. 332,764, 1-26-93, Cl. D12-3.000.

Chauvin, Francois, to Superior SA. Attache case. 332,698, 1-26-93, Cl. D3-76.000.

Chen, Daniel, to Mercury International Trading Corporation. Ornament for footwear. 332,693, 1-26-93, Cl. D2-326.000.

Chernikoff, Nelson N.: *See*—
Moloney, Thomas E.; Chernikoff, Nelson N.; Cassidy, Edward K.; and Mann, John M., 332,750, Cl. D9-556.000.

Chrysalis, Inc.: *See*—
Gulliver, Barron J., 332,703, Cl. D6-338.000.

Chung, Chien-Hsin: *See*—
Wang, Gong-Nan; and Chung, Chien-Hsin, 332,778, Cl. D14-102.000.

Cohon, Bertram, to C. N. Burman Co. Lamp head assembly for torchiere. 332,840, 1-26-93, Cl. D26-93.000.

Cole-Parmer Instrument Company: *See*—
Bloom, David H., 332,738, Cl. 78-380.000.

Combi Corporation: *See*—
Fujieda, Takayuki; and Shiraishi, Masami, 332,810, Cl. D21-110.000.

Compaq Computer Corporation: *See*—
Goodrich, Donald S.; Gluskoter, Steven D.; and Martin, Randall W., 332,799, Cl. D18-55.000.

Cooper, Darrell L., to Marco Company, The. Wicker basket. 332,857, 1-26-93, Cl. D34-42.000.

Cray Research Inc.: *See*—
Dean, Steven J.; Morton, David M.; Reshanov, Eugene N.; and Mueller, Eric J., 332,779, Cl. D14-102.000.

Crowe, Byron A., to Crowe Rope Company. Tie stake. 332,819, 1-26-93, Cl. D21-255.000.

Crowe Rope Company: *See*—
Crowe, Byron A., 332,819, Cl. D21-255.000.

Crowe, William R.; and Silverstein, Steven A., to Lexmark International, Inc. Printer. 332,798, 1-26-93, Cl. D18-55.000.

Dainty Electric Industries Co., Ltd.: *See*—
Lu, Alex, 332,838, Cl. D26-34.000.

Dannenberg, Todd D.; and Giese, Robert C., to Kohler Co. Bathtub with access door. 332,827, 1-26-93, Cl. D23-279.000.

Darr, Richard C.; and Satterfield, Ralph D., to Plastipak Packaging, Inc. Bottle with handle. 332,747, 1-26-93, Cl. D9-520.000.

Davis, Larry. Tape recorder. 332,787, 1-26-93, Cl. D14-160.000.

Dayan, Charles. Display rack. 332,709, 1-26-93, Cl. D6-415.000.

Dean, Steven J.; Morton, David M.; Reshanov, Eugene N.; and Mueller, Eric J., to Cray Research Inc. Computer cabinet. 332,779, 1-26-93, Cl. D14-102.000.

De Falco, Gian F.; Prevignano, Paolo; and Tonengo, Francesco, to Ing. C. Olivetti & C., S.p.A. Typing ribbon cartridge. 332,796, 1-26-93, Cl. D18-12.000.

Delmerico, Paul E., to Rubbermaid Commercial Products Inc. Step-on waste receptacle. 332,852, 1-26-93, Cl. D34-9.000.

Demusz, Stephen A.: *See*—
Lauks, Imants R.; Rogers, Joseph W.; Svezia, John; Wieck, Henry J.; Zelin, Michael; Blyskal, Philip; and Demusz, Stephen A., 332,833, Cl. D24-186.000.

Desnoyers, Charles, to Dutailier Inc. Rocking chair. 332,704, 1-26-93, Cl. D6-347.000.

Diard, Jean-Luc: *See*—
Serves, Myriam; and Diard, Jean-Luc, 332,813, Cl. D21-229.000.

Doi, Tetsuyuki: *See*—
Shinmoto, Takahiko; and Doi, Tetsuyuki, 332,797, Cl. D18-53.000.

Dols, Robert, to Escam Pty. Ltd. Crushing tool. 332,728, 1-26-93, Cl. D7-680.000.

Douglas, William G. Collapsible lounge chair. 332,706, 1-26-93, Cl. D6-368.000.

Dubuque, Kenneth J.: *See*—
Staubitz, Robert B.; Albert, Gregory P.; Dubuque, Kenneth J.; and Vanhorn, Kenneth D., 332,733, Cl. D8-61.000.

Dutailier Inc.: *See*—
Desnoyers, Charles, 332,704, Cl. D6-347.000.

E&B Giftware, Inc.: *See*—
Schildkraut, Micki, 332,697, Cl. D3-75.000.

Egis Personal Safety Systems, Inc.: *See*—
Taylor, Neil R., 332,756, Cl. D10-106.000.

ElectroCom Automation, Inc.: *See*—
Kelly, Edward J.; Zierhut, Clarence; and Howard, Joseph P., 332,776, Cl. D14-100.000.
Kelly, Edward J.; Zierhut, Clarence; and Howard, Joseph P., 332,777, Cl. D14-100.000.

Escam Pty. Ltd.: *See*—
Dols, Robert, 332,728, Cl. D7-680.000.

Fab-Form Products, Inc.: *See*—
Rutter, Thomas M.; and Ward, Douglas K., 332,770, Cl. D12-185.000.

Figgie International Inc.: *See*—
Aubuchon, David B.; Riebel, Karen J.; and Schaefer, William L., 332,686, Cl. D2-29.000.

Floyd, Bobby E. Vest mounted sound system. 332,842, 1-26-93, Cl. D29-11.000.

Ford Motor Company: *See*—
Gauthier, John T.; Scott, Robert P.; Burgy, Jeff; Stoddard, John P.; and Sarre, Robin, 332,790, Cl. D14-299.000.

Forslund, Judith K. Advertising badge. 332,803, 1-26-93, Cl. D20-22.000.

Fujieda, Takayuki; and Shiraishi, Masami, to Combi Corporation. Camera toy. 332,810, 1-26-93, Cl. D21-110.000.

Fushiya, Fusao; and Ohkubo, Hideki, to Makita Electric Works, Ltd. Polisher. 332,734, 1-26-93, Cl. D8-62.000.

Fushiya, Fusao; and Ichikawa, Kiyotaka, to Makita Electric Works, Ltd. Portable electric circular saw. 332,735, 1-26-93, Cl. D8-66.000.

Gagnon, Jacques, to Northern Telecom Limited. Base for a telephone set. 332,786, 1-26-93, Cl. D14-142.000.

Gallitzendorfer, Joseph: *See*—
Sacco, Bruno; Gallitzendorfer, Joseph; and Pfeiffer, Peter, 332,771, Cl. D12-187.000.

Garcia Group, Inc.: *See*—
Garcia, Pedro F., 332,746, Cl. D9-426.000.

Garcia, Pedro F., to Garcia Group, Inc. Box for cut flowers. 332,746, 1-26-93, Cl. D9-426.000.

Gard, Robert W. Game board. 332,805, 1-26-93, Cl. D21-20.000.

Gauthier, John T.; Scott, Robert P.; Burgy, Jeff; Stoddard, John P.; and Sarre, Robin, to Ford Motor Company. Control pushbuttons for a radio system. 332,790, 1-26-93, Cl. D14-299.000.

GCM 600 Limited: *See—*
Krayem, David R., 332,856, Cl. D34-28.000.
Geissler, Richard L.; and Kelly, Roger L., to National Presto Industries, Inc. Appliance for slicing fruits and vegetables. 332,723, 1-26-93, Cl. D7-381.000.
Gensemer, Peter. Reversible scroll directory. 332,800, 1-26-93, Cl. D19-76.000.
Gerlach, Thomas, to Pressalit A/S. Combined toilet seat and cover. 332,830, 1-26-93, Cl. D23-311.000.
Geuvjehizian, Moushegh Y. Combined automatic pet food dispenser and attached bowl. 332,846, 1-26-93, Cl. D30-122.000.
Giard, Edward H., Jr., to Profile for Speed. Combined auxiliary bar and arm rests for attachment to a bicycle handle bar. 332,768, 1-26-93, Cl. D12-178.000.
Giese, Robert C.: *See—*
Dannenberg, Todd D.; and Giese, Robert C., 332,827, Cl. D23-279.000.
Global Upholstery Co., Limited: *See—*
Muller, Vladimir, 332,707, Cl. D6-373.000.
Gluskoter, Steven D.: *See—*
Goodrich, Donald S.; Gluskoter, Steven D.; and Martin, Randall W., 332,799, Cl. D18-55.000.
Gobe, Marc, to Victoria's Secret Stores, Inc. Bottle. 332,742, 1-26-93, Cl. D9-315.000.
Goodman, Sheldon H.; and Greenhut, Steven E. Paper/napkin holder. 332,726, 1-26-93, Cl. D7-631.000.
Goodman, Sheldon H.: *See—*
Greenhut, Steven E.; and Goodman, Sheldon H., 332,802, Cl. D19-85.000.
Goodrich, Donald S.; Gluskoter, Steven D.; and Martin, Randall W., to Compaq Computer Corporation. Desktop electrophotographic printer. 332,799, 1-26-93, Cl. D18-55.000.
Gossman, David L. Pool cue tip tool. 332,814, 1-26-93, Cl. D21-232.000.
Greenhut, Steven E.; and Goodman, Sheldon H. Holder for writing instruments. 332,802, 1-26-93, Cl. D19-85.000.
Greenhut, Steven E.: *See—*
Goodman, Sheldon H.; and Greenhut, Steven E., 332,726, Cl. D7-631.000.
GSA, Inc.: *See—*
Kendrick, John, 332,696, Cl. D3-48.000.
Gulliver, Barron J., to Chrysalis, Inc. Combined chair and tray. 332,703, 1-26-93, Cl. D6-338.000.
Ham, Byung I. Plug-in fluorescent lamp. 332,836, 1-26-93, Cl. D26-26.000.
Hanna, Charles F.; Zurek, Thomas F.; and Khalil, Omar S., to Abbott Laboratories. Disposable immunoassay reaction tray. 332,834, 1-26-93, Cl. D24-223.000.
Hans Friedrich Hefendehl: *See—*
Brussing, Bernd, 332,850, Cl. D34-7.000.
Harada, Mari: *See—*
Watanabe, Hiroshi; and Harada, Mari, 332,774, Cl. D13-147.000.
Hasegawa, Shigeru: *See—*
Ito, Masafumi; Suzuki, Koji; Hasegawa, Shigeru; and Takashima, Katsuhiro, 332,788, Cl. D14-217.000.
Hatfield, Tinker L.; and Smith, Wilson W., to Nike, Inc. Shoe sole bottom and side. 332,692, 1-26-93, Cl. D2-320.000.
HBL Ltd.: *See—*
Tse, Andrew C. S., 332,760, Cl. D11-3.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Pisar, Wolfgang, 332,749, Cl. D9-529.000.
Hill, Tracy. Combined comb and applicator for hair dye. 332,700, 1-26-93, Cl. D4-117.000.
Hines, David M., to Bobrick Washroom Equipment, Inc. Napkin disposal. 332,849, 1-26-93, Cl. D34-6.000.
Hirose Electric Co., Ltd.: *See—*
Sato, Kensaku; and Nakata, Naohisa, 332,773, Cl. D13-149.000.
Hitachi, Ltd.: *See—*
Takita, Hiroto; Nishiyama, Takanori; Urushihara, Atuhiko; Takahashi, Akira; and Ohkura, Akira, 332,794, Cl. D16-202.000.
Honda, Kazuo: *See—*
Pischulti, Markus; Schellhaass, Karl; Tajima, Hajime; Satoh, Taku; and Honda, Kazuo, 332,751, Cl. D9-560.000.
Howard, Joseph P.: *See—*
Kelly, Edward J.; Zierhut, Clarence; and Howard, Joseph P., 332,776, Cl. D14-100.000.
Kelly, Edward J.; Zierhut, Clarence; and Howard, Joseph P., 332,777, Cl. D14-100.000.
I-Stat: *See—*
Lauks, Imants R.; Rogers, Joseph W.; Svezia, John; Wieck, Henry J.; Zelin, Michael; Blyskal, Philip; and Demusz, Stephen A., 332,833, Cl. D24-186.000.
Ichihashi, Toru: *See—*
Kikuchi, Akira; Suzuki, Masahiro; and Ichihashi, Toru, 332,782, Cl. D14-106.000.
Ichikawa, Kiyotaka: *See—*
Fushiya, Fusao; and Ichikawa, Kiyotaka, 332,735, Cl. D8-66.000.
Iino, Masaaki; and Mukasa, Masaharu, to Kabushiki Kaisha Toshiba. Electronic computer. 332,780, 1-26-93, Cl. D14-106.000.
Imperial Wall Coverings, Inc.: *See—*
McCooey, Michael J., 332,744, Cl. D9-415.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Bellini, Mario, 332,795, Cl. D18-12.000.
De Falco, Gian F.; Prevignano, Paolo; and Tonengo, Francesco, 332,796, Cl. D18-12.000.
Ingersoll-Rand Company: *See—*
Staubitz, Robert B.; Albert, Gregory P.; Dubuque, Kenneth J.; and Vanhorn, Kenneth D., 332,733, Cl. D8-61.000.
Iniziative Marittime 1991, s.r.l.: *See—*
Antocci, Joseph D.; and Anderson, George P., 332,835, Cl. D24-224.000.
Innovation Scientifique Dermatologique: *See—*
Lemahieu, Thierry, 332,752, Cl. D9-567.000.
Interlego A.G.: *See—*
Knudsen, Jens N., 332,809, Cl. D21-108.000.
International Business Machines Corporation: *See—*
Wiseman, John A.; and Pangburn, Thomas E., 332,784, Cl. D14-113.000.
Invicta Products Incorporated: *See—*
Kaga, Gary; and Arnott, John, 332,702, Cl. D6-310.000.
Ito, Masafumi; Suzuki, Koji; Hasegawa, Shigeru; and Takashima, Katsuhiro, to Teac Corporation. Audio mixer. 332,788, 1-26-93, Cl. D14-217.000.
Ivester, Gavin R.: *See—*
Krakower, Jonathan; Ivester, Gavin R.; and Brunner, Robert D., 332,783, Cl. D14-106.000.
Iwaki, Yoshiko: *See—*
Asano, Eiji; and Iwaki, Yoshiko, 332,763, Cl. D11-184.000.
Jankowiak, Henry, to Servometer Corporation. Micromanipulator. 332,793, 1-26-93, Cl. D16-136.000.
Jauhal, Kuldip S.; and Jauhal, Meena K. Cooking vessel. 332,721, 1-26-93, Cl. D7-354.000.
Jauhal, Meena K.: *See—*
Jauhal, Kuldip S.; and Jauhal, Meena K., 332,721, Cl. D7-354.000.
Johnston, Robert M., to Canstar Sports Group, Inc. Pair of hockey gloves. 332,845, 1-26-93, Cl. D29-22.000.
Jones, Pierson. Level adapter for determining plumb. 332,753, 1-26-93, Cl. D10-69.000.
Jones, Ronald O., Sr.; and Yutani, Wayne T. Water craft. 332,772, 1-26-93, Cl. D12-307.000.
Jorlov, Richard, to Sandberg Development AB. Small arms telescopic sight. 332,792, 1-26-93, Cl. D16-132.000.
Kaburaki, Masahiko, to Tohgun Kigyo Co., Ltd. Diving helmet. 332,843, 1-26-93, Cl. D29-15.000.
Kabushiki Kaisha Sanki Seikosho: *See—*
Kanzawa, Masaaki, 332,791, Cl. D15-32.000.
Kabushiki Kaisha Toshiba: *See—*
Iino, Masaaki; and Mukasa, Masaharu, 332,780, Cl. D14-106.000.
Kaga, Gary; and Arnott, John, to Invicta Products Incorporated. Picture frame. 332,702, 1-26-93, Cl. D6-310.000.
Kallista, Inc.: *See—*
Robbins, Tom E., 332,824, Cl. D23-252.000.
Kanzawa, Masaaki, to Stone Import & Development Co., Ltd.; and Kabushiki Kaisha Sanki Seikosho. Concrete crusher. 332,791, 1-26-93, Cl. D15-32.000.
Karsten Manufacturing Corporation: *See—*
Solheim, Karsten, 332,812, Cl. D21-220.000.
Kelly, Edward J.; Zierhut, Clarence; and Howard, Joseph P., to ElectroCom Automation, Inc. Portable hand-held personal computer. 332,776, 1-26-93, Cl. D14-100.000.
Kelly, Edward J.; Zierhut, Clarence; and Howard, Joseph P., to ElectroCom Automation, Inc. Combined portable hand-held personal computer and keyboard cradle mount. 332,777, 1-26-93, Cl. D14-100.000.
Kelly, Roger L.: *See—*
Geissler, Richard L.; and Kelly, Roger L., 332,723, Cl. D7-381.000.
Kendrick, John, to GSA, Inc. Combined shopping bag and coupon storage organizer. 332,696, 1-26-93, Cl. D3-48.000.
Keyes Fibre Company: *See—*
Vigue, Henry R., 332,743, Cl. D9-341.000.
Khalil, Omar S.: *See—*
Hanna, Charles F.; Zurek, Thomas F.; and Khalil, Omar S., 332,834, Cl. D24-223.000.
Kikuchi, Akira; Suzuki, Masahiro; and Ichihashi, Toru, to NEC Corporation. Laptop computer. 332,782, 1-26-93, Cl. D14-106.000.
Kim, Tae H. Auxiliary vehicle brake light. 332,837, 1-26-93, Cl. D26-32.000.
Knudsen, Jens N., to Interlego A.G. Element for a toy building set. 332,809, 1-26-93, Cl. D21-108.000.
Kohler Co.: *See—*
Bonnell, Thomas A., 332,823, Cl. D23-250.000.
Bonnell, Thomas A., 332,825, Cl. D23-252.000.
Dannenberg, Todd D.; and Giese, Robert C., 332,827, Cl. D23-279.000.
Koloski, Peter A., to Rubbermaid Incorporated. Front access stacking bin. 332,745, 1-26-93, Cl. D9-424.000.
Kraft General Foods Ltd.: *See—*
Pischulti, Markus; Schellhaass, Karl; Tajima, Hajime; Satoh, Taku; and Honda, Kazuo, 332,751, Cl. D9-560.000.
Krakower, Jonathan; Ivester, Gavin R.; and Brunner, Robert D., to Apple Computer, Inc. Laptop computer. 332,783, 1-26-93, Cl. D14-106.000.
Krayem, David R., to GCM 600 Limited. Forklift vehicle. 332,856, 1-26-93, Cl. D34-28.000.
Kruger, Judith, to Paris Presents Incorporated. Mirrored vanity tray. 332,713, 1-26-93, Cl. D6-511.000.
Kupperman, Dennis, to RB Toy Development Co. Frozen pop confection maker. 332,727, 1-26-93, Cl. D7-672.000.
Lackner, Klaus: *See—*
Schmidt, Roland; and Lackner, Klaus, 332,708, Cl. D6-407.000.

Lauks, Imants R.; Rogers, Joseph W.; Svezia, John; Wieck, Henry J.; Zelin, Michael; Blyskal, Philip; and Demusz, Stephen A., to I-Stat. Portable clinical diagnostic instrument. 332,833, 1-26-93, Cl. D24-186.000.

Lemahieu, Thierry, to Innovation Scientifique Dermatologique. Combined bottle and cap. 332,752, 1-26-93, Cl. D9-567.000.

Levison, Barrie. Household sponge. 332,841, 1-26-93, Cl. D28-63.000.

Lexmark International, Inc.: *See*—
Crowe, William R.; and Silverstein, Steven A., 332,798, Cl. D18-55.000.

Li, Kim-Hung, to Bon Treasure Industrial Co., Ltd. Electronic game housing. 332,804, 1-26-93, Cl. D21-13.000.

Liberty Diversified Industries: *See*—
Waterston, Rebecca L.; and Stoll, Mark S., 332,854, Cl. D34-10.000.

Libman Company, The: *See*—
Berti, Enzo, 332,701, Cl. D4-199.000.

Little Tikes Company, The: *See*—
Spirk, John W., Jr.; and Nottingham, John R., 332,818, Cl. D21-249.000.

Livingston, David. Trash can enclosure. 332,847, 1-26-93, Cl. D34-5.000.

Long, Richard, to Smith & Hawken. Composter. 332,851, 1-26-93, Cl. D34-7.000.

Long, Richard, to Smith & Hawken. Composter panel. 332,853, 1-26-93, Cl. D34-10.000.

Lu, Alex, to Dainty Electric Industries Co., Ltd. Combined speaker and auxiliary brake light for vehicles. 332,838, 1-26-93, Cl. D26-34.000.

Magnusson, Carl G.; and Magnusson, Emanuela F. Umbrella stand. 332,710, 1-26-93, Cl. D6-416.000.

Magnusson, Emanuela F.: *See*—
Magnusson, Carl G.; and Magnusson, Emanuela F., 332,710, Cl. D6-416.000.

Makita Electric Works, Ltd.: *See*—
Fushiya, Fusao; and Ohkubo, Hideki, 332,734, Cl. D8-62.000.
Fushiya, Fusao; and Ichikawa, Kiyotaka, 332,735, Cl. D8-66.000.

Mankey, Neal N., to Allied Plastics, Inc. Halloween vampire decoration. 332,761, 1-26-93, Cl. D11-121.000.

Mann, John M.: *See*—
Moloney, Thomas E.; Chernikoff, Nelson N.; Cassidy, Edward K.; and Mann, John M., 332,750, Cl. D9-556.000.

Marco Company, The: *See*—
Cooper, Darrell L., 332,857, Cl. D34-42.000.

Martin, Randall W.: *See*—
Goodrich, Donald S.; Gluskoter, Steven D.; and Martin, Randall W., 332,799, Cl. D18-55.000.

Marui Ltd.: *See*—
Marui, Rio, 332,766, Cl. D12-136.000.

Marui, Rio, to Marui Ltd. Bicycle tire. 332,766, 1-26-93, Cl. D12-136.000.

Marvzen Kabushiki Kaisha: *See*—
Matsuno, Moritoshi, 332,732, Cl. D8-50.000.

Marziali, Eliseo; and Shin, Y. K., to Mercury International Trading Corporation. Ornament for footwear. 332,694, 1-26-93, Cl. D2-326.000.

Matsuno, Moritoshi, to Marvzen Kabushiki Kaisha. Electric stapler. 332,732, 1-26-93, Cl. D8-50.000.

May, Darrel, to Wiresmith Limited. Wine cell. 332,725, 1-26-93, Cl. D7-618.000.

McCafferty, Lewis D., Jr. Floral display saddle for grave markers. 332,762, 1-26-93, Cl. D11-164.000.

McCloskey, Don R.: *See*—
Torbet, Philip A.; Van Deursen, Gary; and McCloskey, Don R., 332,722, Cl. D7-412.000.

McCooey, Michael J., to Imperial Wall Coverings, Inc. Package for wallpaper. 332,744, 1-26-93, Cl. D9-415.000.

Mercedes Benz AG: *See*—
Sacco, Bruno; Gallitzendorfer, Joseph; and Pfeiffer, Peter, 332,771, Cl. D12-187.000.

Mercury International Trading Corporation: *See*—
Chen, Daniel, 332,693, Cl. D2-326.000.
Marziali, Eliseo; and Shin, Y. K., 332,694, Cl. D2-326.000.
Shin, Y. K., 332,691, Cl. D2-326.000.

Mikiya, Toshio, to Nitto Kohki Co., Ltd. Portable vibrating chisel. 332,736, 1-26-93, Cl. D8-68.000.

Moen Incorporated: *See*—
Rosenbaum, Kevin W., 332,826, Cl. D23-254.000.

Moloney, Thomas E.; Chernikoff, Nelson N.; Cassidy, Edward K.; and Mann, John M., to American National Can Company. Can. 332,750, 1-26-93, Cl. D9-556.000.

Morton, David M.: *See*—
Dean, Steven J.; Morton, David M.; Reshanov, Eugene N.; and Mueller, Eric J., 332,779, Cl. D14-102.000.

Moscovitch, Jerry. Ski case. 332,695, 1-26-93, Cl. D3-36.000.

Motorola, Inc.: *See*—
Nagele, Albert L.; and Novak, Carl V., 332,785, Cl. D14-138.000.
Rak, Roman P., 332,789, Cl. D14-251.000.

Mueller, Eric J.: *See*—
Dean, Steven J.; Morton, David M.; Reshanov, Eugene N.; and Mueller, Eric J., 332,779, Cl. D14-102.000.

Mukasa, Masaharu: *See*—
Iino, Masaaki; and Mukasa, Masaharu, 332,780, Cl. D14-106.000.

Mullen, J. Robert, to Mullen, J. Robert. Golf training aid. 332,817, 1-26-93, Cl. D21-234.000.

Muller, Vladimir, to Global Upholstery Co., Limited. Chair. 332,707, 1-26-93, Cl. D6-373.000.

Nagele, Albert L.; and Novak, Carl V., to Motorola, Inc. Portable telephone. 332,785, 1-26-93, Cl. D14-138.000.

Nakata, Naohisa: *See*—
Sato, Kensaku; and Nakata, Naohisa, 332,773, Cl. D13-149.000.

National Presto Industries, Inc.: *See*—
Geissler, Richard L.; and Kelly, Roger L., 332,723, Cl. D7-381.000.

Navistar International Transportation Corpl: *See*—
West, Kenton L., 332,769, Cl. D12-181.000.

NEC Corporation: *See*—
Kikuchi, Akira; Suzuki, Masahiro; and Ichihashi, Toru, 332,782, Cl. D14-106.000.

Neuroth, Margaret A. B.; and Neuroth, Richard L. Bubble wand. 332,807, 1-26-93, Cl. D21-61.000.

Neuroth, Margaret A. B.; and Neuroth, Richard L. Bubble wand. 332,808, 1-26-93, Cl. D21-61.000.

Neuroth, Richard L.: *See*—
Neuroth, Margaret A. B.; and Neuroth, Richard L., 332,807, Cl. D21-61.000.
Neuroth, Margaret A. B.; and Neuroth, Richard L., 332,808, Cl. D21-61.000.

Nike, Inc.: *See*—
Hatfield, Tinker L.; and Smith, Wilson W., 332,692, Cl. D2-320.000.
Worthington, William J., 332,689, Cl. D2-314.000.

Nishiyama, Takanori: *See*—
Takita, Hiroto; Nishiyama, Takanori; Urushihara, Atuhiko; Takahashi, Akira; and Ohkura, Akira, 332,794, Cl. D16-202.000.

Nitto Kohki Co., Ltd.: *See*—
Mikiya, Toshio, 332,736, Cl. D8-68.000.

Northern, Robert: *See*—
Weldy, Philip D.; and Northern, Robert, 332,754, Cl. D10-69.000.

Northern Telecom Limited: *See*—
Gagnon, Jacques, 332,786, Cl. D14-142.000.

Nottingham, John R.: *See*—
Spirk, John W., Jr.; and Nottingham, John R., 332,818, Cl. D21-249.000.

Novak, Carl V.: *See*—
Nagele, Albert L.; and Novak, Carl V., 332,785, Cl. D14-138.000.

O'Brien, James R.; and Sellers, Mark G. Fishing bobber. 332,820, 1-26-93, Cl. D22-1446.000.

Ohkubo, Hideki: *See*—
Fushiya, Fusao; and Ohkubo, Hideki, 332,734, Cl. D8-62.000.

Ohkura, Akira: *See*—
Takita, Hiroto; Nishiyama, Takanori; Urushihara, Atuhiko; Takahashi, Akira; and Ohkura, Akira, 332,794, Cl. D16-202.000.

Olson, Norman J. Support platform for compact disc and tape players. 332,711, 1-26-93, Cl. D6-449.000.

Padilla, Ronald G. Fishing pole holder. 332,821, 1-26-93, Cl. D22-147.000.

Pangburn, Thomas E.: *See*—
Wiseman, John A.; and Pangburn, Thomas E., 332,784, Cl. D14-113.000.

Pardo, John: *See*—
Reece, John S.; Pardo, John; and Beechuk, Timothy J., 332,748, Cl. D9-528.000.

Paris Presents Incorporated: *See*—
Kruger, Judith, 332,713, Cl. D6-511.000.

Peersmann, Richard F. M., to Pollyflame International B.V. Clip dispenser. 332,801, 1-26-93, Cl. D19-75.000.

Petschek, Nick, to ReSeal International Limited Partnership. Dispensing container. 332,739, 1-26-93, Cl. D9-300.000.

Pfeiffer, Peter: *See*—
Sacco, Bruno; Gallitzendorfer, Joseph; and Pfeiffer, Peter, 332,771, Cl. D12-187.000.

Pisar, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Combined bottle and cap. 332,749, 1-26-93, Cl. D9-529.000.

Pischulti, Markus; Schellhaass, Karl; Tajima, Hajime; Satoh, Taku; and Honda, Kazuo, to Kraft General Foods Ltd. Combined jar and cap. 332,751, 1-26-93, Cl. D9-560.000.

Plastic Forming Company, Inc., The: *See*—
Schurman, Peter T., 332,699, Cl. D3-76.000.

Plastipak Packaging, Inc.: *See*—
Darr, Richard C.; and Satterfield, Ralph D., 332,747, Cl. D9-520.000.

Pollyflame International B.V.: *See*—
Peersmann, Richard F. M., 332,801, Cl. D19-75.000.

Porter, Marvin M., to Texas Trunk Company, Inc. Spice rack. 332,724, 1-26-93, Cl. D7-616.000.

Powell, Monsita L. Panty liners for toddlers. 332,832, 1-26-93, Cl. D24-126.000.

Pressalit A/S: *See*—
Gerlach, Thomas, 332,830, Cl. D23-311.000.

Prevignano, Paolo: *See*—
De Falco, Gian F.; Prevignano, Paolo; and Tonengo, Francesco, 332,796, Cl. D18-12.000.

Procter & Gamble Company, The: *See*—
Reece, John S.; Pardo, John; and Beechuk, Timothy J., 332,748, Cl. D9-528.000.

Profile for Speed: *See*—
Giard, Edward H., Jr., 332,768, Cl. D12-178.000.

Pulse Lite, Inc.: *See*—
Thomas, Frank W.; and Brown, Donald, 332,757, Cl. D10-114.000.

Raab, John J., to Robeson Industries Corp. Combination electric can opener, clock/timer, and knife sharpener. 332,731, 1-26-93, Cl. D8-34.000.

Rak, Roman P., to Motorola, Inc. Communication equipment stand for mounting in the interior of a vehicle. 332,789, 1-26-93, Cl. D14-251.000.

RB Toy Development Co.: *See*—
Kupperman, Dennis, 332,727, Cl. D7-672.000.

Reece, John S.; Pardo, John; and Beechuk, Timothy J., to Procter & Gamble Company, The. Bottle. 332,748, 1-26-93, Cl. D9-528.000.

Reid, Karl: *See*—
Reid, Kevin A.; Reid, Karl; and Cameron, Russell J., 332,822, Cl. D23-233.000.

Reid, Kevin A.; Reid, Karl; and Cameron, Russell J., to Ross Operating Valve Company. Valve. 332,822, 1-26-93, Cl. D23-233.000.

Reinsenthel "programm": *See*—
Schmidt, Roland; and Lackner, Klaus, 332,708, Cl. D6-407.000.

ReSeal International Limited Partnership: *See*—
Petschek, Nick, 332,739, Cl. D9-300.000.

Reshanov, Eugene N.: *See*—
Dean, Steven J.; Morton, David M.; Reshanov, Eugene N.; and Mueller, Eric J., 332,779, Cl. D14-102.000.

Riebel, Karen J.: *See*—
Aubuchon, David B.; Riebel, Karen J.; and Schaefer, William L., 332,686, Cl. D2-29.000.

Rivas, Arthur V. Golf swing trainer. 332,815, 1-26-93, Cl. D21-234.000.

Robbins, Gerald D. Shopping bag. 332,740, 1-26-93, Cl. D9-305.000.

Robbins, Tom E., to Kallista, Inc. Handle for plumbing fixtures and accessories. 332,824, 1-26-93, Cl. D23-252.000.

Robeson Industries Corp.: *See*—
Raab, John J., 332,731, Cl. D8-34.000.

Rogers, Joseph W.: *See*—
Lauks, Imants R.; Rogers, Joseph W.; Svezia, John; Wieck, Henry J.; Zelin, Michael; Blyskal, Philip; and Demusz, Stephen A., 332,833, Cl. D24-186.000.

Rosenbaum, Kevin W., to Moen Incorporated. Combined shower escutcheon and water control handle. 332,826, 1-26-93, Cl. D23-254.000.

Ross Operating Valve Company: *See*—
Reid, Kevin A.; Reid, Karl; and Cameron, Russell J., 332,822, Cl. D23-233.000.

Rougerie, Georges, to Societe Pour La Transformation Des Matieres Plastiques Stamp. Chaise lounge. 332,705, 1-26-93, Cl. D6-361.000.

Royse, Alistair G.; and Auld, David J., to Australian Medical Technology Pty. Ltd. Medical trolley. 332,855, 1-26-93, Cl. D34-19.000.

Rubbermaid Commercial Products Inc.: *See*—
Delmerico, Paul E., 332,852, Cl. D34-9.000.

Rubbermaid Incorporated: *See*—
Koloski, Peter A., 332,745, Cl. D9-424.000.

Rutter, Thomas M.; and Ward, Douglas K., to Fab-Form Products, Inc. Mud guard. 332,770, 1-26-93, Cl. D12-185.000.

Ryobi Ltd.: *See*—
Shinmoto, Takahiko; and Doi, Tetsuyuki, 332,797, Cl. D18-53.000.

Sacco, Bruno; Gallitzendorfer, Joseph; and Pfeiffer, Peter, to Mercedes Benz AG. Outside rear view mirror. 332,771, 1-26-93, Cl. D12-187.000.

Salomon S.A.: *See*—
Serves, Myriam; and Diard, Jean-Luc, 332,813, Cl. D21-229.000.

Sandberg Development AB: *See*—
Jorlov, Richard, 332,792, Cl. D16-132.000.

Sarre, Robin: *See*—
Gauthier, John T.; Scott, Robert P.; Burgy, Jeff; Stoddard, John P.; and Sarre, Robin, 332,790, Cl. D14-299.000.

Sasagawa, Toru: *See*—
Tsuda, Toru; and Sasagawa, Toru, 332,767, Cl. D12-147.000.

Sato, Kensaku; and Nakata, Naohisa, to Hirose Electric Co., Ltd. Terminal for an electrical connector. 332,773, 1-26-93, Cl. D13-149.000.

Satoh, Taku: *See*—
Pischulti, Markus; Schellhaass, Karl; Tajima, Hajime; Satoh, Taku; and Honda, Kazuo, 332,751, Cl. D9-560.000.

Satterfield, Ralph D.: *See*—
Darr, Richard C.; and Satterfield, Ralph D., 332,747, Cl. D9-520.000.

Schaefer, William L.: *See*—
Aubuchon, David B.; Riebel, Karen J.; and Schaefer, William L., 332,686, Cl. D2-29.000.

Schaen, Jan H., to Schaen, Jan H. Adjustable table base. 332,712, 1-26-93, Cl. D6-496.000.

Schaerrer, Jean-Pierre. Wash basin. 332,828, 1-26-93, Cl. D23-284.000.

Schellhaass, Karl: *See*—
Pischulti, Markus; Schellhaass, Karl; Tajima, Hajime; Satoh, Taku; and Honda, Kazuo, 332,751, Cl. D9-560.000.

Schildkraut, Micki, to E&B Giftware, Inc. Jewelry organizer. 332,697, 1-26-93, Cl. D3-75.000.

Schmidt, Roland; and Lackner, Klaus, to Reinsenthel "programm". Cassette holder. 332,708, 1-26-93, Cl. D6-407.000.

Schurman, Peter T., to Plastic Forming Company, Inc., The. Carrying case. 332,699, 1-26-93, Cl. D3-76.000.

Scott, Robert P.: *See*—
Gauthier, John T.; Scott, Robert P.; Burgy, Jeff; Stoddard, John P.; and Sarre, Robin, 332,790, Cl. D14-299.000.

Sedighzadeh, Marty; and Bromley, Robert, to Sedighzadeh, Marty. Ceiling or wall-mounted TV monitor support. 332,714, 1-26-93, Cl. D6-513.000.

Sedighzadeh, Marty; and Bromley, Robert, to Sedighzadeh, Marty. Ceiling or wall mounted TV monitor support. 332,715, 1-26-93, Cl. D6-513.000.

Seikosha Co., Ltd.: *See*—
Sugano, Hisako, 332,759, Cl. D10-130.000.

Sellers, Mark G.: *See*—
O'Brien, James R.; and Sellers, Mark G., 332,820, Cl. D22-1446.000.

Serves, Myriam; and Diard, Jean-Luc, to Salomon S.A. Ski. 332,813, 1-26-93, Cl. D21-229.000.

Servometer Corporation: *See*—
Jankowiak, Henry, 332,793, Cl. D16-136.000.

Sessions, James R. Tree stake support. 332,729, 1-26-93, Cl. D8-1.000.

Shenkal, Yuval: *See*—
Altman, Peter R.; and Shenkal, Yuval, 332,687, Cl. D2-265.000.

Shields, Gerald. Combined coffee maker and cup. 332,720, 1-26-93, Cl. D7-305.000.

Shin, Y. K., to Mercury International Trading Corporation. Ornament for footwear. 332,691, 1-26-93, Cl. D2-326.000.

Shin, Y. K.: *See*—
Marziali, Eliseo; and Shin, Y. K., 332,694, Cl. D2-326.000.

Shinmoto, Takahiko; and Doi, Tetsuyuki, to Ryobi Ltd. Offset printing machine. 332,797, 1-26-93, Cl. D18-53.000.

Shiraishi, Masami: *See*—
Fujieda, Takayuki; and Shiraishi, Masami, 332,810, Cl. D21-110.000.

Shyan, Huang C. Bell. 332,758, 1-26-93, Cl. D10-116.000.

Silverstein, Steven A.: *See*—
Crowe, William R.; and Silverstein, Steven A., 332,798, Cl. D18-55.000.

Smith & Hawken: *See*—
Long, Richard, 332,851, Cl. D34-7.000.
Long, Richard, 332,853, Cl. D34-10.000.

Smith, Wilson W.: *See*—
Hatfield, Tinker L.; and Smith, Wilson W., 332,692, Cl. D2-320.000.

Societe Pour La Transformation Des Matieres Plastiques Stamp: *See*—
Rougerie, Georges, 332,705, Cl. D6-361.000.

Solheim, Karsten, to Karsten Manufacturing Corporation. Set of golf club heads. 332,812, 1-26-93, Cl. D21-220.000.

Spirk, John W., Jr.; and Nottingham, John R., to Little Tikes Company, The. Merry-go-round toy. 332,818, 1-26-93, Cl. D21-249.000.

Staubitz, Robert B.; Albert, Gregory P.; Dubuque, Kenneth J.; and Vanhorn, Kenneth D., to Ingersoll-Rand Company. Pneumatic tool. 332,733, 1-26-93, Cl. D8-61.000.

Stoddard, John P.: *See*—
Gauthier, John T.; Scott, Robert P.; Burgy, Jeff; Stoddard, John P.; and Sarre, Robin, 332,790, Cl. D14-299.000.

Stoll, Mark S.: *See*—
Waterston, Rebecca L.; and Stoll, Mark S., 332,854, Cl. D34-10.000.

Stone Import & Development Co., Ltd.: *See*—
Kanzawa, Masaaki, 332,791, Cl. D15-32.000.

Sugano, Hisako, to Seikosha Co., Ltd. Pendulum for clock. 332,759, 1-26-93, Cl. D10-130.000.

Superior SA: *See*—
Chauvin, Francois, 332,698, Cl. D3-76.000.

Suplick, George E. Face guard for a motorcycle helmet. 332,844, 1-26-93, Cl. D29-16.000.

Suzuki, Koji: *See*—
Ito, Masafumi; Suzuki, Koji; Hasegawa, Shigeru; and Takashima, Katsuhiro, 332,788, Cl. D14-217.000.

Suzuki, Masahiro: *See*—
Kikuchi, Akira; Suzuki, Masahiro; and Ichihashi, Toru, 332,782, Cl. D14-106.000.

Svezia, John: *See*—
Lauks, Imants R.; Rogers, Joseph W.; Svezia, John; Wieck, Henry J.; Zelin, Michael; Blyskal, Philip; and Demusz, Stephen A., 332,833, Cl. D24-186.000.

Tajima, Hajime: *See*—
Pischulti, Markus; Schellhaass, Karl; Tajima, Hajime; Satoh, Taku; and Honda, Kazuo, 332,751, Cl. D9-560.000.

Takahashi, Akira: *See*—
Takita, Hiroto; Nishiyama, Takanori; Urushihara, Atuhiko; Takahashi, Akira; and Ohkura, Akira, 332,794, Cl. D16-202.000.

Takashima, Katsuhiro: *See*—
Ito, Masafumi; Suzuki, Koji; Hasegawa, Shigeru; and Takashima, Katsuhiro, 332,788, Cl. D14-217.000.

Takita, Hiroto; Nishiyama, Takanori; Urushihara, Atuhiko; Takahashi, Akira; and Ohkura, Akira, to Hitachi, Ltd. Combined video tape recorder and camera. 332,794, 1-26-93, Cl. D16-202.000.

Tarver, Donnie W. Golf stance and swing guide. 332,816, 1-26-93, Cl. D21-234.000.

Taylor, Neil R., to Egis Personal Safety Systems, Inc. Personal security alarm. 332,756, 1-26-93, Cl. D10-106.000.

Teac Corporation: *See*—
Ito, Masafumi; Suzuki, Koji; Hasegawa, Shigeru; and Takashima, Katsuhiro, 332,788, Cl. D14-217.000.

Tellinghuisen, Kelvin L. Paraplegic's tricycle. 332,765, 1-26-93, Cl. D12-128.000.

Texas Trunk Company, Inc.: *See*—
Porter, Marvin M., 332,724, Cl. D7-616.000.

Thomas, Frank W.; and Brown, Donald, to Pulse Lite, Inc. Signal light for timing a pulse rate. 332,757, 1-26-93, Cl. D10-114.000.

Toedter, Peter K., to AST Research, Inc. Housing for notebook computer. 332,781, 1-26-93, Cl. D14-106.000.

Tohgun Kigyo Co., Ltd.: *See*—
Kaburaki, Masahiko, 332,843, Cl. D29-15.000.

Tonengo, Francesco: *See*—
De Falco, Gian F.; Prevignano, Paolo; and Tonengo, Francesco, 332,796, Cl. D18-12.000.

Top Kogyo Co., Ltd.: *See*—
Usuda, Genji, 332,730, Cl. D8-25.000.
Torbet, Philip A.; Van Deursen, Gary; and McCloskey, Don R., to Black & Decker Inc. Attachment for a hand mixer. 332,722, 1-26-93, Cl. D7-412.000.
Truelsen, Ejnar, to A/S Eccolet Sko. Shoe sole. 332,690, 1-26-93, Cl. D2-320.000.
Tse, Andrew C. S., to HBL Ltd. Watchband. 332,760, 1-26-93, Cl. D11-3.000.
Tsuda, Toru; and Sasagawa, Toru, to Bridgestone Corporation. Automobile tire. 332,767, 1-26-93, Cl. D12-147.000.
Turner, Lawrence H. Container. 332,741, 1-26-93, Cl. D9-307.000.
Urushihara, Atuhiko: *See*—
Takita, Hiroto; Nishiyama, Takanori; Urushihara, Atuhiko; Takahashi, Akira; and Ohkura, Akira, 332,794, Cl. D16-202.000.
Usuda, Genji, to Top Kogyo Co., Ltd. Ratchet wrench. 332,730, 1-26-93, Cl. D8-25.000.
Van Deursen, Gary: *See*—
Torbet, Philip A.; Van Deursen, Gary; and McCloskey, Don R., 332,722, Cl. D7-412.000.
Vanhorn, Kenneth D.: *See*—
Staubitz, Robert B.; Albert, Gregory P.; Dubuque, Kenneth J.; and Vanhorn, Kenneth D., 332,733, Cl. D8-61.000.
Victoria's Secret Stores, Inc.: *See*—
Gobe, Marc, 332,742, Cl. D9-315.000.
Vigue, Henry R., to Keyes Fibre Company. Package for fragile tubes. 332,743, 1-26-93, Cl. D9-341.000.
Walters, Rodney E. Dished basketball goal. 332,811, 1-26-93, Cl. D21-201.000.
Wang, Gong-Nan; and Chung, Chien-Hsin, to Aset Industrial Co. Ltd. Central processor unit for computer. 332,778, 1-26-93, Cl. D14-102.000.
Ward, Douglas K.: *See*—
Rutter, Thomas M.; and Ward, Douglas K., 332,770, Cl. D12-185.000.
Watanabe, Hiroshi; and Harada, Mari, to Yazaki Corporation. Electric connector housing. 332,774, 1-26-93, Cl. D13-147.000.
Waterston, Rebecca L.; and Stoll, Mark S., to Liberty Diversified Industries. Caddy for attachment to a waste receptacle. 332,854, 1-26-93, Cl. D34-10.000.
Weldy, Philip D.; and Northern, Robert. Pipe bending level. 332,754, 1-26-93, Cl. D10-69.000.
Wentworth, Betty: *See*—
Wentworth, Wayne E.; and Wentworth, Betty, 332,737, Cl. D8-98.000.
Wentworth, Wayne E.; and Wentworth, Betty. Ceiling tile knife. 332,737, 1-26-93, Cl. D8-98.000.
West, Kenton L., to Navistar International Transportation Corpl. Pair of extension panels for a vehicle roof fairing. 332,769, 1-26-93, Cl. D12-181.000.
Wieck, Henry J.: *See*—
Lauks, Imants R.; Rogers, Joseph W.; Svezia, John; Wieck, Henry J.; Zelin, Michael; Blyskal, Philip; and Demusz, Stephen A., 332,833, Cl. D24-186.000.
Williams, Robert T. Compartmented trash receptacle. 332,848, 1-26-93, Cl. D34-5.000.
Wiresmith Limited: *See*—
May, Darrel, 332,725, Cl. D7-618.000.
Wiseman, John A.; and Pangburn, Thomas E., to International Business Machines Corporation. Display for computers. 332,784, 1-26-93, Cl. D14-113.000.
Wolfe, Russell, III. Free form shelf combination. 332,716, 1-26-93, Cl. D6-570.000.
Wolfe, Russell, III. Shelving assembly. 332,717, 1-26-93, Cl. D6-570.000.
Wolfe, Russell, III. Shelving assembly. 332,718, 1-26-93, Cl. D6-574.000.
Wolfe, Russell, III. Shelf. 332,719, 1-26-93, Cl. D6-574.000.
Worthington, William J., to Nike, Inc. Shoe upper. 332,689, 1-26-93, Cl. D2-314.000.
Yazaki Corporation: *See*—
Watanabe, Hiroshi; and Harada, Mari, 332,774, Cl. D13-147.000.
Yutani, Wayne T.: *See*—
Jones, Ronald O., Sr.; and Yutani, Wayne T., 332,772, Cl. D12-307.000.
Zelin, Michael: *See*—
Lauks, Imants R.; Rogers, Joseph W.; Svezia, John; Wieck, Henry J.; Zelin, Michael; Blyskal, Philip; and Demusz, Stephen A., 332,833, Cl. D24-186.000.
Zierhut, Clarence: *See*—
Kelly, Edward J.; Zierhut, Clarence; and Howard, Joseph P., 332,776, Cl. D14-100.000.
Kelly, Edward J.; Zierhut, Clarence; and Howard, Joseph P., 332,777, Cl. D14-100.000.
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Stoots, Eleanor, 8,119, Cl. 87.120.

Omura, Mitsuo: *See*—
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ISSUED JANUARY 26, 1993

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CLASS 2

46 5,181,274
48 5,181,275
161 R 5,181,276
195 5,181,277
243 R 5,181,278
413 5,181,279
452 5,181,280

CLASS 4

227.2 5,181,281
404 5,181,282
496 5,181,283
572.1 5,181,284
657 5,181,285

CLASS 5

8 5,181,286
482 5,181,287
607 5,181,288
612 5,181,289

CLASS 8

442 5,181,935

CLASS 15

98 5,181,290
5,181,291
236.08 5,181,292
250.21 5,181,293
315 5,181,294

CLASS 16

95 R 5,181,296

CLASS 19

65 A 5,181,295

CLASS 24

336 5,181,297
429 5,181,298
432 5,181,299
585 5,181,300

CLASS 29

169.5 5,181,301
243.56 5,181,302
255 5,181,303
271 5,181,304
401.1 5,181,317
408 5,181,305
413 5,181,306
434 5,181,307
436 5,181,308
465 5,181,309
517 5,181,310
609 5,181,311
611 5,181,312
620 5,181,313
623.2 5,181,936
796 5,181,314
798 5,181,315
828 5,181,316
882 5,181,318
890.053 5,181,319

CLASS 30

123 5,181,320
357 5,181,321
416 5,181,322

CLASS 33

245 5,181,323
270 5,181,324
510 5,181,325
527 5,181,326
833 5,181,327

CLASS 34

97 5,181,328
156 5,181,329
162 5,181,330

CLASS 36

50.1 5,181,331
114 5,181,332

CLASS 38

15 5,181,333

CLASS 40

524 5,181,334
607 5,181,335

CLASS 42

90 5,182,412

CLASS 43

24 5,181,336
44.83 5,181,337
58 5,181,338

CLASS 47

72 5,181,339

CLASS 48

95 5,181,937

CLASS 49

371 5,181,340
477 5,181,341

CLASS 51

60 5,181,342
135 R 5,181,343
165.75 5,181,344
165.77 5,181,345
287 5,181,375
293 5,181,938
298 5,181,939
327 5,181,346
370 5,181,347
410 5,181,348
5,181,349

CLASS 52

12 5,181,350
35 5,181,351
58 5,181,352
79.1 5,181,353
5,181,354
80 5,181,355
167 DF 5,181,356
179 5,181,357
233 5,181,358
253 5,181,359
520 5,181,360
535 5,181,361
594 5,181,362
685 5,181,363

CLASS 53

397 5,181,364
455 5,181,365
470 5,181,366
473 5,181,367
587 5,181,368

CLASS 55

16 5,181,940
5,181,941
31 5,181,942
72 B1 4,869,735
98 5,181,943
235 5,181,944
290 5,181,945
381 5,181,946

CLASS 56

12.7 5,181,369
14.7 5,181,370
17.4 5,181,371
5,181,372
329 5,181,373

CLASS 57

264 5,181,374

CLASS 60

39.05 5,181,376
39.31 5,181,377
39.55 5,181,378
261 5,181,379
405 5,181,380
648 5,181,381

CLASS 62

3.2 5,181,382
6 5,181,383
12 5,181,384
51.1 5,181,385
51.2 5,181,386
59 5,181,387
77 5,181,388
126 5,181,389
5,181,390
129 5,181,391
160 5,181,392
264 5,181,393
371 5,181,394
506 5,181,395
541 5,181,396

CLASS 63

12 5,181,397

CLASS 65

2 5,181,947
105 5,181,948
375 5,181,949

CLASS 68

12.06 5,181,398
13 R 5,181,399
200 5,181,400
5,181,401

CLASS 70

18 5,181,402
38 C 5,181,403
203 5,181,404
232 5,181,405
337 5,181,406
361 5,181,407

CLASS 71

9 5,181,950
64.11 5,181,951

CLASS 72

11 5,181,408
46 5,181,409
256 5,181,410
302 5,181,411
307 5,181,412
416 5,181,413

CLASS 73

40.7 5,181,414
54.28 5,181,415
104 5,181,416
107.1 5,181,438
115 5,181,417
146.3 5,181,418
153 5,181,419
204.15 5,181,420
597 5,181,421
715 5,181,422
724 5,181,423
835 5,181,424
862.08 5,181,425
862.541 5,181,426
863.12 5,181,427
5,181,428

CLASS 74

89.15 5,181,429
99 R 5,181,430
333 5,181,431
395 5,181,432
409 5,181,433
447 5,181,434
492 5,181,435
551.2 5,181,436
594.1 5,181,437

CLASS 75

237 5,181,953
433 5,181,954
443 5,181,955
743 5,181,956
772 5,181,957

CLASS 81

119 5,181,439
484 5,181,440

CLASS 82

1.11 5,181,441
19 5,181,442

CLASS 83

72 5,181,443
154 5,181,444
155 5,181,445
438 5,181,446
447 5,181,447
468.3 5,181,448

CLASS 84

377 5,182,413
634 5,182,414
660 5,182,415
723 5,182,416

CLASS 87

58 5,181,449

CLASS 91

41 5,181,450
170 MP 5,181,451
418 5,181,452

CLASS 92

12.2 5,181,453

CLASS 99

277.2 5,181,454
391 5,181,455
485 5,181,456
514 5,181,457
538 5,181,458
546 5,181,459

CLASS 100

34 5,181,460
88 5,181,461
98 R 5,181,462
137 5,181,463

CLASS 101

28 5,181,464
103 5,181,465
142 5,181,466
147 5,181,467
216 5,181,468
415.1 5,181,469
425 5,181,470
483 5,181,471

CLASS 102

204 5,182,417
475 5,182,418
523 5,182,419

CLASS 104

2 5,181,472

CLASS 105

133 5,181,473
355 5,181,474

CLASS 106

170 5,181,958
211 5,181,959
419 5,181,960
724 5,181,961

CLASS 110

345 5,181,475

CLASS 111

60 5,181,476

CLASS 114

39.1 5,181,477
270 5,181,478

CLASS 118

306 5,181,962
325 5,181,963
719 5,181,964

CLASS 119

3 5,181,479
165 5,181,480

CLASS 122

4 D 5,181,481
392 5,181,482

CLASS 123

41.12 5,181,483
46 SC 5,181,495
90.17 5,181,484
5,181,485
5,181,486
179.11 5,181,488
195 C 5,181,487
242 5,181,489
243 5,181,490
336 5,181,491
337 5,181,492
431 5,181,493
446 5,181,494
493 5,181,496
520 5,181,497
557 Re.34,166
633 5,181,498
690 5,181,499

CLASS 124

5 5,181,500
10 5,181,501
44.5 5,181,502

CLASS 125

21 5,181,503

CLASS 128

36 5,181,504
200.26 5,181,505
201.22 5,181,506
201.25 5,181,507
203.12 5,181,508
207.140 5,181,509
368 5,181,510
419 PG 5,181,511
660.03 5,181,512
660.07 5,181,513
660.09 5,181,514
672 5,181,515
673 5,181,516
5,181,517
696 5,181,518
704 5,181,519
731 5,181,520
736 5,181,521
748 5,181,522
764 5,181,523
5,181,524
781 5,181,525
784 5,181,526
830 5,181,527

CLASS 131

256 5,181,528

CLASS 132

209 5,181,529
279 5,181,530
308 5,181,531

CLASS 134

8 5,181,965
42 5,181,966
5,181,967

CLASS 136

256 5,181,968

CLASS 137

14 5,181,532
268 5,181,533
501 5,181,534
515.5 5,181,535
557 B1 4,872,483
559 5,181,536
561 A 5,181,537
595 B1 5,056,559
607 5,181,538
625.32 5,181,539
625.46 5,181,540
899 5,181,541

CLASS 138

44 5,181,542
90 5,181,543

CLASS 139

452 5,181,544

CLASS 140

92.1 5,181,545
93.4 5,181,546

CLASS 141

46 5,181,547

CLASS 148

103 5,181,971
111 5,181,972
302 5,181,973
320 5,181,974
552 5,181,969
610 5,181,970

CLASS 152

152.1 5,181,975
209 R 5,181,976
429 5,181,977
541 5,181,978

CLASS 156

89 5,181,979
93 5,181,980
209 5,181,981
415 5,181,982
523 5,181,983
630 5,181,984
635 5,181,985
643 5,181,986

CLASS 159

4.08 5,181,987

CLASS 160

172 5,181,548

CLASS 162

135 5,181,988
241 5,181,989

CLASS 164

79 5,181,549
100 5,181,550
113 5,181,551

CLASS 165

21 5,181,552
22 5,181,553
41 5,181,554
5,181,555
80.1 5,181,556
113 5,181,557
133 5,181,558
134.1 5,181,559
162 5,181,560
5,181,561
166 5,181,562

CLASS 166

55.6 5,181,564
66 5,181,565
117.5 5,181,566
279 5,181,567
293 5,181,568
317 5,181,569
381 5,181,570
5,181,571

CLASS 172

6 5,181,572
459 5,181,573
816 5,181,574

CLASS 173

180 5,181,575

CLASS 174

52.4 5,182,420
250 5,182,421

CLASS 175

57 Re.34,167
61 5,181,576
261 5,181,577
424 5,181,578

CLASS 180

6.48 5,181,579
116 5,181,580
148 5,181,581

CLASS 182

121 5,181,582
129 5,181,583
201 5,181,584

CLASS 184

7.4 5,181,585

CLASS 187

1 A 5,181,586

CLASS 188

1.12 5,181,587
73.31 5,181,588
374 5,181,589

CLASS 190

18 A 5,181,590

CLASS 191

12 R 5,181,591

CLASS 192

4 A 5,181,592
30 W 5,181,593
70.27 5,181,594

CLASS 196

110 5,181,990

CLASS 198

335 5,181,595
365 5,181,596
5,181,597
377 5,181,598
468.6 5,181,599
812 5,181,600
831 5,181,601

CLASS 200

43.015 5,181,602
61.54 5,182,422
5,182,423
302.1 5,181,603

CLASS 202

176 5,181,991

CLASS 203

29 5,181,992

CLASS 204

86 5,181,[illegible]
97 5,181,[illegible]
101 5,181,995
5,181,996
129.1 5,181,997
147 5,182,007
157.15 5,181,998
180.1 5,181,999
181.1 5,182,000
192.12 5,182,001
210 5,182,002
298.23 5,182,003
409 5,182,004
435 5,182,005

CLASS 205

77 5,181,770
213 5,182,006
238 5,182,009

CLASS 206

5.1 5,181,604
37.1 5,181,605
77.1 5,181,606
273 5,181,607
301 5,181,608
370 5,181,609
447 5,181,610
453 5,181,611
546 5,181,612
567 5,181,613
584 5,181,614

CLASS 208

39 5,182,011
44 5,182,010
137 5,182,012
348 5,182,013

CLASS 209

31 5,181,616
5,181,617
164 5,182,014
239 5,181,618
702 5,181,619

CLASS 210

94 5,182,015
139 5,182,008
198.2 5,182,016
225 5,182,017
282 5,182,018
321.8 5,182,019
512.1 5,182,020
605 5,182,021
638 5,182,022
652 5,182,023
654 5,182,024
681 5,182,025
688 5,182,026
696 5,182,027
697 5,482,028
724 5,182,029
748 5,182,030
781 5,182,031

CLASS 211

59.3 5,181,620
181 5,181,621
183 5,181,622
5,181,623

CLASS 215

330 5,181,624

CLASS 219

10.53 5,182,424
10.55 E 5,182,425
10.55 F 5,182,426
10.75 5,182,427
121.35 B1 4,609,809
121.63 5,182,428
5,182,429
5,182,430
121.72 5,182,434
121.85 5,182,433
202 5,182,432
203 5,182,431
230 5,182,435
262 5,182,436
270 5,182,437
386 5,182,438
412 5,182,439
535 5,182,440

CLASS 220

1.5 5,181,625
282 5,181,626
404 5,181,627
5,181,628
618 5,181,615

CLASS 222

80 5,181,629
109 5,181,630
129.2 5,181,631
153 5,181,632
195 5,181,633
212 5,181,634
383 5,181,635
389 5,181,636

CLASS 224

196 5,181,637
215 5,181,638
328 5,181,639

CLASS 225

93 5,181,640

CLASS 226

74 5,181,641
137 5,181,642

CLASS 227

110 5,181,643
147 5,181,644
177 5,181,645

CLASS 228

4.5 5,181,646
44.3 5,181,647
201 5,181,648

CLASS 229

19 5,181,649
103 5,181,650
121 5,181,651
243 5,181,652

CLASS 235

472 5,182,441
492 5,182,442

CLASS 236

49.3 5,181,653
91 C 5,181,654

CLASS 237

1 R 5,181,655
8 C 5,181,656

CLASS 238

8 5,181,657

CLASS 239

493 5,181,658
556 5,181,659
589.1 5,181,660
704 5,181,661

CLASS 241

16 5,181,662
81 5,181,663
261.3 5,181,664
292.1 5,181,665

CLASS 242

47.01 5,181,666
54 R 5,181,668
56 R 5,181,667
5,181,669
67.1 R 5,181,670
71.1 5,181,671
5,181,672

CLASS 244

3.12 5,181,673
47 5,181,674
54 5,181,675
110 B 5,181,676
129.5 5,181,677
219 5,181,678

CLASS 246

182 R 5,181,679

CLASS 248

61 5,181,680
125 5,181,681
210 5,181,682
227 5,181,683
231.6 5,181,684
293 5,181,685
346 5,181,686
479 5,181,687
680 5,181,688

CLASS 249

91 5,182,032

CLASS 250

201.2 5,182,443
201.5 5,182,444
208.1 5,182,445
5,182,446
5,182,447
214 B 5,182,448
227.14 5,182,449
234 5,182,450
282 5,182,451
307 5,182,452
309 5,182,453
310 5,182,454
548 5,182,455
551 5,182,456
572 5,182,457

CLASS 251

149.6 5,181,689
163 B1 4,917,354
172 5,181,690
315 5,181,691
367 5,181,692

CLASS 252

8.6 5,182,033
32.5 5,182,034
34 5,182,035
47.5 5,182,036
5,182,037
51.5 A 5,182,038
5,182,041
61 5,182,039
67 5,182,040
172 5,182,042
174 5,182,043
174.24 5,182,044
186.38 5,182,045
188.26 5,182,046
299.66 5,182,047
363.5 5,182,048
378 R 5,182,049
500 5,182,050
645 5,182,051

CLASS 254

2 R 5,181,693
133 R 5,181,694

CLASS 256

13.1 5,181,695

CLASS 257

40 5,182,624
49 5,182,627
72 5,182,620
142 5,182,626
230 5,182,623
231 5,182,622
382 5,182,619
443 5,182,625
546 5,182,621
577 5,182,629
664 5,182,631
707 5,182,628
713 5,182,632
787 5,182,630

CLASS 264

1.2 5,182,052
1.4 5,182,053
15 5,182,054
22 5,182,055
5,182,056
31 5,182,057
54 5,182,058
65 5,182,059
70 5,182,060
72 5,182,061
129 5,182,062
132 5,182,063
137 5,182,064
153 5,182,065
169 5,182,066
184 5,182,067
210.2 5,182,069
210.8 5,182,068
241 5,182,070
272.13 5,182,071
349 5,182,072

CLASS 266

52 5,182,073
87 5,182,074

CLASS 267

64.17 5,181,696
116 5,181,697
140.12 5,181,698
221 5,181,699

CLASS 269

24 5,181,700
32 5,181,701
43 5,181,703
93 5,181,702

CLASS 270

54 5,181,704

CLASS 271

3 5,181,705
11 5,181,706
20 5,181,707
21 5,181,708
97 5,181,709
98 5,181,710
5,181,711
109 5,181,712
160 5,181,713
186 5,181,714
272 5,181,715

CLASS 273

51 5,181,716
58 BA 5,181,717
69 5,181,718
80.2 5,181,720
127 B 5,181,722
177 A 5,181,721
186.5 5,181,723
363 5,181,724
402 5,181,725
409 5,181,719
414 5,181,726
450 5,181,727

CLASS 277

53 5,181,728
62 5,181,729
167.5 5,181,730

CLASS 280

47.131 5,181,731
279 5,181,732
304 5,181,733
414.1 5,181,734
642 5,181,735
719 5,181,736
732 5,181,737
755 5,181,740
801 5,181,738
807 5,181,739
845 5,181,741

CLASS 281

45 5,181,742

CLASS 283

48.1 5,181,743
56 5,181,744
94 5,181,745

CLASS 285

3 5,181,746
21 5,181,747
24 5,181,748
26 5,181,749
38 5,181,750
39 5,181,751
81 5,181,752
205 5,181,753

CLASS 290

55 5,182,458

CLASS 292

216 5,181,754

CLASS 294

1.1 5,181,755
68.1 5,181,756
159 5,181,757

CLASS 296

68.1 5,181,758
153 5,181,759
181 5,181,760

CLASS 297

250 5,181,761
358 5,181,762
391 5,181,763
452 5,181,764
467 5,181,765

CLASS 299

1.2 5,181,934
34 5,181,766

CLASS 301

37.37 5,181,767

CLASS 303

84.2 5,181,768
114.3 5,181,769

CLASS 307

10.1 5,182,459
10.8 5,182,460
41 5,182,461
43 5,182,462
46 5,182,463
87 5,182,464
115 5,182,465
127 5,182,466
243 5,182,467
296.1 5,182,468
296.2 5,182,469
296.4 5,182,470
355 5,182,471
446 5,182,472
454 5,182,473
465 5,182,474
B1 4,912,348
475 5,182,475
B1 4,916,337
491 5,182,476
494 5,182,477
521 5,182,478
571 5,182,479
608 5,182,480

CLASS 310

13 5,182,481
89 5,182,482
211 5,182,483
328 5,182,484
334 5,182,485

CLASS 312

7.2 5,181,771
348.4 5,181,772

CLASS 313

25 5,182,486
440 5,182,487
446 5,182,488
485 5,182,489
5,182,490
503 5,182,491

CLASS 315

14 5,182,492
39.610 5,182,493
80 5,182,494
111.41 5,182,495
5,182,496
159 5,182,502
224 5,182,503
370 5,182,504
383 5,182,497

CLASS 318

15 5,182,498
254 5,182,499
5,182,500
443 5,182,501
565 5,182,505
568.1 5,182,506
685 5,182,507
801 5,182,508

CLASS 320

14 5,182,509

CLASS 322

21 5,182,510

CLASS 323

311 B1 4,300,090

CLASS 324

158 MG 5,182,511
175 5,182,512
232 5,182,513
244 5,182,514
259 5,182,515
326 5,182,516
418 5,182,517
511 5,182,518
611 5,182,519
663 5,182,523

CLASS 328

142 5,182,520
167 5,182,521
5,182,522

CLASS 330

149 5,182,524
253 5,182,525
257 5,182,526
285 5,182,527

CLASS 331

1 A 5,182,528
57 5,182,529

CLASS 333

18 5,182,530
167 5,182,531

CLASS 335

35 5,182,532
306 5,182,533

CLASS 336

12 5,182,535
65 5,182,536
180 5,182,537

CLASS 337

102 5,182,538
310 5,182,539

CLASS 338

223 5,182,540

CLASS 340

428 5,182,541
521 5,182,542
531 5,182,543
572 5,182,544
620 5,182,545
636 5,182,546
664 5,182,547
706 5,182,548
784 5,182,549
825.05 5,182,550
825.24 5,182,551
825.25 5,182,552
825.44 5,182,553
826 5,182,554
905 5,182,555
984 5,182,556

CLASS 341

20 5,182,557
118 5,182,558
144 5,182,559
158 5,182,560
166 5,182,561

CLASS 342

25 5,182,562
32 5,182,563
53 5,182,564
124 5,182,565
357 5,182,566
460 B1 4,543,580
465 B1 4,792,806

CLASS 343

702 5,182,568
781 CA 5,182,569
795 5,182,570

CLASS 346

1.1 5,182,571
5,182,572
5,182,573
76 PH 5,182,574
108 5,182,575
5,182,576
140 R 5,182,577
5,182,578
5,182,579
5,182,580
5,182,581
5,182,582
5,182,583
157 5,182,584

CLASS 351

41 5,182,585
47 5,182,586
124 5,182,587
165 5,182,588

CLASS 354

105 5,182,589
106 5,182,590
145.1 Re.34,168
195.1 5,182,591
221 5,182,592
322 5,182,593

CLASS 355

20 5,182,594
200 5,182,595
203 5,182,596
205 5,182,597
208 5,182,598
5,182,599
246 5,182,600
270 5,182,601
271 5,182,602
273 5,182,603
5,182,604
274 5,182,605
289 5,182,606
316 5,182,534
323 5,182,607
326 5,182,608

CLASS 356

328 5,182,609
349 5,182,610
350 5,182,611
351 5,182,612
374 5,182,613
376 5,182,614
400 5,182,615
402 5,182,616
440 5,182,617
446 5,182,618

CLASS 358

11 5,182,633
12 5,182,634
5,182,635
27 Re.34,169
41 5,182,636
75 5,182,637
80 5,182,638
81 5,182,639
86 5,182,640
103 5,182,641
133 5,182,642
140 5,182,643
5,182,644
141 5,182,645
193.1 5,182,646
213.11 5,182,647
5,182,648
227 5,182,649
296 5,182,650
5,182,651
5,182,652
320 5,182,654
406 5,182,655
452 5,182,656
465 5,182,657
483 5,182,658

CLASS 359

17 5,182,659
49 5,182,660
54 5,182,661
63 5,182,662
70 5,182,663
93 5,182,664
95 5,182,665
107 5,182,666
124 5,182,667
218 5,182,668
241 5,182,669
359 5,182,670
557 5,182,671
652 5,182,672
691 5,182,673
694 5,182,674
841 5,182,675
5,182,676

CLASS 360

14.2 5,182,677
32 5,182,678
48 5,182,679
60 5,182,680
70 5,182,681
77.08 5,182,682
77.16 5,182,683
78.09 5,182,684
78.13 5,182,685
92 5,182,686
5,182,687
94 5,182,688
103 5,182,689
120 5,182,690
128 5,182,691
132 5,182,692
135 5,182,693

CLASS 361

229 5,182,694
321 5,182,695
380 5,182,696
393 5,182,697
395 5,182,698
5,182,699
400 5,182,700

CLASS 362

72 5,181,774
75 5,181,773
116 5,181,927
234 5,181,775
351 5,181,776
405 5,181,777

CLASS 363

98 5,182,701
132 5,182,702

CLASS 364

148 5,182,703
5,182,704
401 5,182,705
406 5,182,706
413.11 5,182,707
419 5,182,708
5,182,709
424.01 5,182,713
424.05 5,182,711
424.07 5,182,712
424.1 5,182,710
474.03 5,182,714
474.24 5,182,715
476 5,182,716
481 5,182,717
490 5,182,718
5,182,719
509 5,182,720
526 5,182,721
551.01 5,182,722
748 5,182,723

CLASS 365

151 5,182,724
185 5,182,725
203 5,182,726
230.06 5,182,727

CLASS 367

7 5,182,728
38 5,182,729
83 5,182,730
84 5,182,731
173 5,182,732

CLASS 368

82 5,182,733

CLASS 369

13 5,182,734
5,182,735
32 5,182,736
44.14 5,182,738
44.15 5,182,739
47 5,182,737
5,182,740
50 5,182,741
116 5,182,742
275.4 5,182,743

CLASS 370

16 5,182,744
85.1 5,182,745
85.5 5,182,747
94.1 5,182,748
100.1 5,182,746
5,182,749
110.1 5,182,750
5,182,751

CLASS 371

16.3 5,182,755
37.7 5,182,752
43 5,182,753
68.3 5,182,754

CLASS 372

38 5,182,756
45 5,182,757
46 5,182,758
72 5,182,759

CLASS 374

119 5,181,778
139 5,181,779

CLASS 375

52 5,182,760
119 5,182,761
122 5,182,762

CLASS 376

150 5,182,075
250 5,182,076
416 5,182,077

CLASS 378

34 5,182,763
57 5,182,764

CLASS 379

88 5,182,765
216 5,182,766
355 5,182,767
387 5,182,768
5,182,769

CLASS 380

4 5,182,770
5 5,182,771
49 5,182,772

CLASS 381

41 5,182,773
71 5,182,774

CLASS 382

8 5,182,775
14 5,182,776
18 5,182,777
54 5,182,778

CLASS 384

8 5,181,780
21 5,181,781
5,181,782
114 5,181,783
222 5,181,784
288 5,181,785

CLASS 385

13 5,182,779
14 5,182,780
33 5,182,781
89 5,182,782
123 5,182,783
128 5,182,784
5,182,785
5,182,786
131 5,182,787
5,182,788
137 5,182,789
141 5,182,790
147 5,182,791

CLASS 392

389 5,182,567
468 5,182,792

CLASS 395

13 5,182,793
23 5,182,794
142 5,182,795
156 5,182,796
160 5,182,797
200 5,182,798
400 5,182,799
425 5,182,800
5,182,801
5,182,802
575 5,182,803
600 5,182,804
650 5,182,805
700 5,182,806
5,182,807
725 5,182,808
5,182,809
750 5,182,810
800 5,182,811

CLASS 400

61 5,181,786
120 5,181,787
232 5,181,788
248 5,181,789
708 5,181,801

CLASS 401

75 5,181,790
266 5,181,791

CLASS 403

359 5,181,792

CLASS 404

4 5,181,793
6 5,181,794

CLASS 405

70 5,181,802
128 5,181,795
5,181,796
129 5,181,803
131 5,181,797
170 5,181,798
195.1 5,181,799
259.6 5,181,800

CLASS 406

67 5,181,804
189 5,181,805
5,181,806
190 5,181,807

CLASS 408

1 R 5,181,808
3 5,181,809
147 5,181,810
230 5,181,811
234 5,181,812

CLASS 409

182 5,181,813

CLASS 410

122 5,181,814
140 5,181,815

CLASS 411

60 5,181,816
369 5,181,817

CLASS 414

217 5,181,819
331 5,181,820
414 5,181,818
427 5,181,821
462 5,181,822
730 5,181,823
751 5,181,824
786 5,181,825

CLASS 415

173.1 5,181,826
173.3 5,181,827
200 5,181,828

CLASS 416

134 A 5,181,829
223 R 5,181,830

CLASS 417

222 S 5,181,831
234 5,181,832
5,181,833
269 5,181,834
310 5,181,835
313 5,181,836
350 5,181,837
360 5,181,838
5,181,839
364 5,181,840
423.3 5,181,841
474 5,181,842

CLASS 418

1 5,181,843
152 5,181,844

CLASS 419

9 5,182,078

CLASS 420

87 5,182,079
588 5,182,080

CLASS 422

56 5,182,081
57 5,182,082
63 5,182,083
105 5,182,084
144 5,182,085
171 5,182,086
228 5,182,087

CLASS 423

210 5,182,088
219 5,182,089
348 5,182,091
387 5,182,092
446 5,182,093
462 5,182,094
659 5,182,095
704 5,182,090

CLASS 424

45 5,182,096
5,182,097
47 5,182,098
49 5,182,099
5,182,100
54 5,182,101
78.02 5,182,105
78.03 5,182,103
78.07 5,182,104
78.1 5,182,102
78.31 5,182,106
85.91 5,182,107
92 5,182,109
195.1 5,182,110
424 5,182,111
439 5,182,112
537 5,182,113
673 5,182,114

CLASS 425

71 5,182,115
125 5,182,116
144 5,182,117
192 R 5,182,118
222 5,182,119
238 5,182,120
338 5,182,121
526 5,182,122

CLASS 426

19 5,182,123
5,182,124
68 5,182,125
74 5,182,126
241 5,182,127
410 5,182,128
589 5,182,129

CLASS 427

3 5,182,130
8 5,182,131
9 5,182,139
98 5,182,135
126.3 5,182,136
138 5,182,137
157 5,182,138
230 5,182,140
379 5,182,141
393.5 5,182,142
409 5,182,143
516 5,182,133
543 5,182,134
577 5,182,132

CLASS 428

16 5,182,144
31 5,182,145
5,182,146
34.4 5,182,147
34.6 5,182,148
5,182,149
35.7 5,182,150
36.92 5,182,151
42 5,182,152
64 5,182,153
96 5,182,154
116 5,182,155
130 5,182,156
137 5,182,157
178 5,182,158
192 5,182,159
195 5,182,160
5,182,161
219 5,182,162
224 5,182,163
234 5,182,164
263 5,182,165
318.6 5,182,167
330 5,182,168
343 5,182,169
368 5,182,166
391 5,182,173
450 5,182,174
537.5 5,182,175
551 5,182,170
623 5,182,171
632 5,182,172
930 5,182,176

CLASS 429

48 5,182,177
160 5,182,178
254 5,182,179

CLASS 430

1 5,182,180
108 5,182,181
124 5,182,182
165 5,182,183
5,182,184
5,182,185
270 5,182,186
271 5,182,187
323 5,182,188
449 5,182,189
546 5,182,190

CLASS 431

7 5,181,845
80 5,181,846
253 5,181,847

CLASS 433

30 5,181,848
153 5,181,849
205 5,181,850

CLASS 434

226 5,181,851
B1 4,861,270

CLASS 435

7.23 5,182,192
7.9 5,182,191
29 5,182,193
69.1 5,182,195
69.5 5,182,196
122 5,182,197
126 5,182,198
130 5,182,194
162 5,182,199
172.3 5,182,200
176 5,182,201
189 5,182,202
196 5,182,203
222 5,182,204
240.2 5,182,205
253.3 5,182,206
253.5 5,182,207
254 5,182,208
280 5,182,209
320.1 5,182,210
5,182,211

CLASS 436

2 5,182,212
66 5,182,213
88 5,182,214
514 5,182,215
518 5,182,216

CLASS 437

5 5,182,217
22 5,182,218
27 5,182,219
34 5,182,220
41 5,182,222
52 5,182,224
58 5,182,225
60 5,182,223
67 5,182,221
70 5,182,226
72 5,182,227
129 5,182,228
162 5,182,229
173 5,182,230
5,182,231
200 5,182,232
226 5,182,233
233 5,182,234
238 5,182,235

CLASS 439

52 5,181,852
67 5,181,853
5,181,854
74 5,181,855
125 5,181,856
157 5,181,857
188 5,181,858
225 5,181,859
321 5,181,860
578 5,181,861
595 5,181,862
610 5,181,863
620 5,181,864
752 5,181,865
850 5,181,866
854 5,181,867

CLASS 440

38 5,181,868
53 5,181,869
77 5,181,870
5,181,871
101 5,181,872

CLASS 441

65 5,181,873

CLASS 445

24 5,181,874

CLASS 446

15 5,181,875
47 5,181,876
337 5,181,877

CLASS 452

109 5,181,878
160 5,181,879
174 5,181,880

CLASS 453

57 5,181,881
63 5,181,882

CLASS 454

49 5,181,883
246 5,181,884

CLASS 464

170 5,181,885

CLASS 470

40 5,181,886

CLASS 474

101 5,181,887
5,181,888
110 5,181,889
237 5,181,890

CLASS 475

162 5,181,891
168 5,181,892
203 5,181,893

CLASS 482

70 5,181,894
93 5,181,895
97 5,181,896
141 5,181,897

CLASS 483

3 5,181,898

CLASS 493

34 5,181,899
210 5,181,900
331 5,181,901

CLASS 501

66 5,182,237
91 5,182,238
98 5,182,239
139 5,182,240

CLASS 502

24 5,182,241
66 5,182,242
79 5,182,243
110 5,182,244
115 5,182,245
161 5,182,246
217 5,182,247
230 5,182,248
303 5,182,249
314 5,182,250

401 5,182,251

CLASS 503

227 5,182,252

CLASS 504

347 5,181,952

CLASS 505

1 5,182,253
5,182,254
5,182,255
5,182,256

CLASS 514

2 5,182,257
3 5,182,258
8 5,182,259
12 5,182,260
5,182,261
13 5,182,262
16 5,182,263
5,182,264
18 5,182,265
5,182,266
34 5,182,267
39 5,182,268
44 5,182,269
58 5,182,270
77 5,182,271
80 5,182,272
83 5,182,273
167 5,182,274
222.8 5,182,275
224.2 5,182,276
231.2 5,182,277
233.8 5,182,278
250 5,182,279
252 5,182,280
5,182,281
253 5,182,282
254 5,182,283
255 5,182,284
5,182,285
256 5,182,286
260 5,182,287
278 5,182,288
5,182,289
293 5,182,290
300 5,182,291
321 5,182,292
340 5,182,293
341 5,182,294
365 5,182,295
376 5,182,296
438 5,182,297
455 5,182,298
460 5,182,299
471 5,182,300
539 5,182,301
573 5,182,302
583 5,182,303
625 5,182,304
629 5,182,305
5,182,306

CLASS 521

12 5,182,236
51 5,182,307
79 5,182,308
99 5,182,309
116 5,182,310
131 5,182,311
149 5,182,312
155 5,182,313
160 5,182,314

CLASS 522

37 5,182,315
99 5,182,316

CLASS 523

112 5,182,317
216 5,182,318

CLASS 524

68 5,182,319
88 5,182,320
100 5,182,321
308 5,182,322
322 5,182,323
379 5,182,324
404 5,182,325
514 5,182,326
556 5,182,327
803 5,182,328

CLASS 525

30 5,182,335
132 5,182,336
176 5,182,337
187 5,182,338
242 5,182,329
5,182,339
247 5,182,330
294 5,182,331
305 5,182,332
315 5,182,333
397 5,182,334
438 5,182,344
462 5,182,345
503 5,182,346
508 5,182,347
525 5,182,340

CLASS 526

125 5,182,341
206 5,182,342
240 5,182,343
256 5,182,348
265 5,182,349
279 5,182,351
308 5,182,350
329.2 5,182,352

CLASS 528

31 5,182,353
60 5,182,354
75 5,182,355
128 5,182,356
137 5,182,357
191 5,182,358
193 5,182,359
205 5,182,360
371 5,182,361
486 5,182,362
499 5,182,363

CLASS 530

324 5,182,364
326 5,182,365
334 5,182,366
350 5,182,367
388.73 5,182,368
647 5,182,369

CLASS 534

16 5,182,370
612 5,182,371
857 5,182,372

CLASS 536

4.1 5,182,373
5,182,378
16.5 5,182,374
23.2 5,182,376
23.5 5,182,375
24.32 5,182,377
63 5,182,379
90 5,182,380

CLASS 540

4 5,182,381
141 5,182,382
225 5,182,383
302 5,182,384
350 5,182,385
5,182,386
590 5,182,387

CLASS 544

195 5,182,388
219 5,182,389
222 5,182,390
236 5,182,391

CLASS 546

15 5,182,397
171 5,182,398
199 5,182,399
250 5,182,400
287 5,182,401

CLASS 548

204 5,182,402
231 5,182,403
237 5,182,404
335.1 5,182,405
520 5,182,392

CLASS 549

4 5,182,393
557 5,182,394

CLASS 552

251 5,182,395
653 5,182,396

CLASS 554

13 5,182,406
52 5,182,407

CLASS 556

55 5,182,408
146 5,182,409
187 5,182,410
409 5,182,411

CLASS 600

13 5,181,902
36 5,181,903

CLASS 602

32 5,181,904
41 5,181,905
63 5,181,906

CLASS 604

22 5,181,907
24 5,181,908
52 5,181,909
67 5,181,910
96 5,181,911
110 5,181,912
263 5,181,913
307 5,181,914
385.1 5,181,915
385.2 5,181,563

CLASS 606

16 5,181,916
61 5,181,917
92 5,181,918
144 5,181,919
159 5,181,920
195 5,181,921
202 5,181,922
228 5,181,923

CLASS 623

20 5,181,924
5,181,925
22 5,181,926
23 5,181,928
5,181,929
5,181,930
40 5,181,931
52 5,181,932
55 5,181,933

D2—	29	332,686			332,715		424	332,745	D13—	147	332,774		85	332,802		311	332,830
	265	332,687		570	332,716		426	332,746		149	332,773	D20—	22	332,803		335	332,831
	314	332,688			332,717		520	332,747	D14—	100	332,775	D21—	13	332,804	D24—	126	332,832
		332,689		574	332,718		528	332,748			332,776		20	332,805		186	332,833
	320	332,690			332,719		529	332,749			332,777		28	332,806		223	332,834
		332,692	D7—	305	332,720		556	332,750		102	332,778		61	332,807		224	332,835
	326	332,691		354	332,721		560	332,751			332,779			332,808	D26—	26	332,836
		332,693		381	332,723		567	332,752		106	332,780		108	332,809		32	332,837
		332,694		412	332,722	78—	380	332,738			332,781		110	332,810		34	332,838
D3—	36	332,695		616	332,724	D10—	69	332,753			332,782		201	332,811		37	332,839
	48	332,696		618	332,725			332,754			332,783		220	332,812		93	332,840
	75	332,697		631	332,726			332,755		113	332,784		229	332,813	D28—	63	332,841
	76	332,698		672	332,727		106	332,756		138	332,785		232	332,814	D29—	11	332,842
		332,699		680	332,728		114	332,757		142	332,786		234	332,815		15	332,843
D4—	117	332,700	D8—	1	332,729		116	332,758		160	332,787			332,816		16	332,844
	199	332,701		25	332,730		130	332,759		217	332,788			332,817		22	332,845
D6—	310	332,702		34	332,731	D11—	3	332,760		251	332,789		249	332,818	D30—	122	332,846
	338	332,703		50	332,732		121	332,761		299	332,790		255	332,819	D34—	5	332,847
	347	332,704		61	332,733		164	332,762	D15—	32	332,791	D22—	147	332,821			332,848
	361	332,705		62	332,734		184	332,763	D16—	132	332,792		446	332,820		6	332,849
	368	332,706		66	332,735	D12—	3	332,764		136	332,793	D23—	233	332,822		7	332,850
	373	332,707		68	332,736		128	332,765		202	332,794		250	332,823			332,851
	407	332,708		98	332,737		136	332,766	D18—	12	332,795		252	332,824		9	332,852
	415	332,709	D9—	300	332,739		147	332,767			332,796			332,825		10	332,853
	416	332,710		305	332,740		178	332,768		53	332,797		254	332,826			332,854
	449	332,711		307	332,741		181	332,769		55	332,798		279	332,827		19	332,855
	496	332,712		315	332,742		185	332,770			332,799		284	332,828		28	332,856
	511	332,713		341	332,743		187	332,771	D19—	75	332,801		292	332,829		42	332,857
	513	332,714		415	332,744		307	332,772		76	332,800						

CLASSIFICATION OF PLANTS

P.—	28	8,114	36	8,115	41.1	8,116	76	8,117		8,118	87.12	8,119

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 5,181,301
5,181,434
5,181,915
5,181,981
5,182,789
02 : 5,182,588
04 : 5,181,313
5,181,369
5,181,783
5,182,008
5,182,071
5,182,476
5,182,505
5,182,585
5,182,611
5,182,728
05 : 5,181,323
5,181,432
5,181,462
4,917,354
06 : 5,181,283
5,181,292
5,181,299
5,181,303
5,181,325
5,181,326
5,181,335
5,181,338
5,181,352
5,181,356
5,181,376
5,181,381
5,181,384
5,181,394
5,181,395
5,181,404
5,181,456
5,181,459
5,181,471
5,181,480
5,181,510
5,181,556
5,181,567
5,181,571
5,181,596
5,181,601
5,181,621
5,181,622
5,181,623
5,181,632
5,181,635
5,181,637
5,181,647
5,181,649
5,181,651
5,181,656
5,181,677
5,181,685
5,181,695
5,181,718
5,181,740
5,181,741
5,181,742
5,181,752
5,181,767
5,181,771
5,181,793
5,181,849
5,181,855
5,181,863
5,181,874
5,181,880
5,181,919
5,181,920
5,181,932
5,181,933
5,181,948
5,181,977
5,181,991
5,181,999
5,182,012
5,182,027
5,182,045
5,182,053
5,182,055
5,182,056
5,182,060
5,182,083
5,182,093
5,182,155
5,182,165
5,182,184
5,182,191
5,182,204
5,182,217
5,182,219
5,182,225
5,182,270
5,182,313
5,182,327
5,182,344
5,182,353
5,182,364
5,182,366
5,182,375
5,182,377
5,182,416
5,182,419
5,182,427
5,182,451
5,182,456
5,182,462
5,182,475
5,182,477
5,182,484
5,182,488
5,182,524
5,182,526
5,182,530
5,182,533
5,182,548
5,182,614
08 : 5,181,440
5,181,479
5,181,509
5,181,524
5,181,814
5,181,816
5,181,824
5,181,975
5,182,014
5,182,529
5,182,557
5,182,665
5,182,750
5,182,751
5,182,802
09 : 5,181,349
5,181,416
5,181,422
5,181,460
5,181,541
5,181,586
5,181,650
5,181,770
5,181,796
5,181,923
5,182,006
5,182,070
5,182,150
5,182,290
5,182,315
5,182,360
5,182,386
5,182,532
5,182,572
5,182,592
5,182,700
5,182,705
5,182,798
10 : 5,181,525
5,181,956
5,182,040
5,182,180
5,182,203
5,182,303
5,182,342
5,182,405
11 : 5,182,262
12 : Re.34,169
5,181,284
5,181,290
5,181,308
5,181,353
5,181,362
5,181,370
5,181,399
5,181,508
5,181,552
5,181,580
5,181,619
5,181,653
5,181,721
5,181,725
5,181,750
5,181,757
5,181,820
5,181,907
5,181,912
5,181,917
5,182,154
5,182,326
5,182,553
5,182,568
5,182,800
5,182,809
4,543,580
4,792,806
13 : 5,181,333
5,181,393
5,181,631
5,181,795
5,181,797
5,181,808
5,181,966
5,181,967
5,182,162
5,182,744
5,182,804
16 : 5,181,778
5,181,789
5,181,904
5,182,232
4,912,348
17 : 5,181,318
5,181,339
5,181,364
5,181,366
5,181,375
5,181,382
5,181,425
5,181,449
5,181,464
5,181,494
5,181,543
5,181,557
5,181,606
5,181,670
5,181,693
5,181,722
5,181,745
5,181,815
5,181,852
5,181,875
5,181,886
5,181,901
5,181,909
5,181,957
5,182,039
5,182,069
5,182,085
5,182,086
5,182,201
5,182,245
5,182,266
5,182,272
5,182,287
5,182,492
5,182,501
5,182,535
5,182,593
5,182,686
5,182,712
5,182,732
5,182,749
5,182,759
5,182,761
5,182,766
18 : 5,181,379
5,181,474
5,181,503
5,181,579
5,181,593
5,181,609
5,181,702
5,181,841
5,181,925
5,181,928
5,181,936
5,182,043
5,182,213
5,182,283
5,182,465
5,182,646
19 : 5,181,368
5,181,428
5,182,441
20 : 5,181,348
5,181,568
5,181,844
5,181,899
5,182,137
5,182,268
5,182,449
21 : 5,181,583
5,181,611
5,181,896
5,182,346
5,182,347
22 : 5,181,439
5,181,879
5,181,951
23 : 5,182,643
5,182,692
24 : 5,181,506
5,181,660
5,181,851
5,182,015
5,182,077
5,182,082
5,182,092
5,182,215
5,182,496

5,182,563
5,182,706
25 : 5,181,482
5,181,514
5,181,518
5,181,555
5,181,641
5,181,678
5,181,682
5,181,684
5,181,723
5,181,728
5,181,755
5,181,777
5,181,826
5,181,869
5,181,940
5,181,965
5,182,046
5,182,048
5,182,107
5,182,130
5,182,157
5,182,173
5,182,176
5,182,177
5,182,260
5,182,299
5,182,365
5,182,426
5,182,444
5,182,659
5,182,709
5,182,752
5,182,782
5,182,801
4,300,090
26 : 5,181,315
5,181,341
5,181,346
5,181,354
5,181,363
5,181,435
5,181,438
5,181,444
5,181,447
5,181,540
5,181,581
5,181,588
5,181,592
5,181,599
5,181,605
5,181,628
5,181,686
5,181,687
5,181,694
5,181,731
5,181,737
5,181,739
5,181,756
5,181,759
5,181,773
5,181,792
5,181,837
5,181,839
5,181,843
5,181,913
5,181,922
5,181,939
5,181,968
5,181,995
5,182,026
5,182,030
5,182,079
5,182,142
5,182,200
5,182,311
5,182,403
5,182,502
5,182,543

5,182,642
5,182,675
5,182,772
27 : 5,181,337
5,181,347
5,181,365
5,181,389
5,181,413
5,181,598
5,181,655
5,181,817
5,181,832
5,181,910
5,181,911
5,182,016
5,182,035
5,182,125
5,182,127
5,182,134
5,182,255
5,182,316
5,182,425
5,182,498
5,182,594
5,182,624
5,182,670
5,182,682
5,182,689
28 : 5,181,502
29 : 5,181,291
5,181,378
5,181,405
5,181,446
5,181,448
5,181,572
5,181,681
5,181,842
5,182,178
5,182,302
5,182,319
5,182,369
5,182,720
31 : 5,181,627
5,181,683
5,181,703
32 : 5,181,519
5,181,529
5,182,436
33 : 5,181,908
5,182,571
5,182,806
34 : 5,181,277
5,181,316
5,181,481
5,181,486
5,181,521
5,181,548
5,181,680
5,181,744
5,181,763
5,181,866
5,181,905
5,181,930
5,181,942
5,181,960
5,181,989
5,182,000
5,182,036
5,182,078
5,182,098
5,182,116
5,182,126
5,182,168
5,182,185
5,182,236
5,182,242
5,182,243
5,182,254
5,182,263
5,182,264

5,182,271
5,182,288
5,182,289
5,182,298
5,182,304
5,182,305
5,182,333
5,182,334
5,182,350
5,182,384
5,182,385
5,182,393
5,182,397
5,182,654
5,182,787
4,861,270
35 : 5,181,859
5,181,883
5,181,934
36 : 5,181,278
5,181,282
5,181,310
5,181,314
5,181,320
5,181,329
5,181,390
5,181,465
5,181,517
5,181,531
5,181,610
5,181,620
5,181,679
5,181,764
5,181,823
5,181,830
5,181,836
5,181,848
5,181,853
5,181,861
5,181,937
5,181,941
5,181,946
5,181,964
5,182,022
5,182,038
5,182,041
5,182,042
5,182,062
5,182,080
5,182,106
5,182,139
5,182,158
5,182,172
5,182,188
5,182,189
5,182,230
5,182,247
5,182,261
5,182,306
5,182,374
5,182,391
5,182,394
5,182,417
5,182,513
5,182,607
5,182,608
5,182,647
5,182,652
5,182,733
5,182,735
5,182,773
5,182,778
5,182,797
37 : 5,181,302
5,181,311
5,181,400
5,181,401
5,181,582
5,181,667
5,181,669

5,181,903
5,182,050
5,182,073
5,182,143
5,182,166
5,182,727
5,182,747
38 : 5,181,573
39 : 5,181,285
5,181,294
5,181,304
5,181,350
5,181,371
5,181,377
5,181,391
5,181,424
5,181,547
5,181,550
5,181,551
5,181,614
5,181,615
5,181,618
5,181,630
5,181,636
5,181,704
5,181,761
5,181,765
5,181,804
5,181,805
5,181,806
5,181,807
5,181,812
5,181,828
5,181,877
5,181,898
5,182,033
5,182,037
5,182,057
5,182,058
5,182,149
5,182,293
5,182,297
5,182,318
5,182,341
5,182,357
5,182,387
5,182,399
5,182,439
5,182,482
5,182,541
5,182,542
5,182,545
5,182,547
5,182,567
5,182,716
5,182,784
4,872,483
40 : 5,181,345
5,181,421
5,181,535
5,181,537
5,181,561
5,181,835
5,181,962
5,182,244
5,182,330
5,182,556
41 : 5,181,342
5,181,373
5,181,445
5,181,657
5,181,914
5,182,234
5,182,467
42 : 5,181,279
5,181,286
5,181,355
5,181,361
5,181,411
5,181,463

5,181,475
5,181,507
5,181,538
5,181,602
5,181,634
5,181,642
5,181,664
5,181,791
5,181,800
5,181,857
5,181,858
5,181,862
5,181,865
5,181,867
5,182,018
5,182,021
5,182,028
5,182,090
5,182,119
5,182,148
5,182,174
5,182,179
5,182,192
5,182,292
5,182,328
5,182,331
5,182,337
5,182,355
5,182,410
5,182,412
5,182,429
5,182,431
5,182,508
5,182,539
5,182,791
5,056,559
43 : 5,182,544
44 : 5,181,590
5,182,111
5,182,164
5,182,552
5,182,616
45 : 5,181,275
5,181,613
5,181,719
5,181,813
5,181,895
5,182,066
5,182,805
46 : 5,181,733
47 : 5,181,644
5,181,821
5,182,345
5,182,379
5,182,438
48 : Re.34,166
5,181,274
5,181,280
5,181,319
5,181,358
5,181,360
5,181,388
5,181,487
5,181,505
5,181,533
5,181,542
5,181,570
5,181,576
5,181,578
5,181,676
5,181,708
5,181,720
5,181,734
5,181,788
5,181,798
5,181,799
5,181,833
5,181,897
5,181,902
5,181,945

5,182,013
5,182,023
5,182,025
5,182,029
5,182,034
5,182,051
5,182,102
5,182,170
5,182,222
5,182,223
5,182,258
5,182,310
5,182,340
5,182,408
5,182,446
5,182,514
5,182,536
5,182,554
5,182,558
5,182,560
5,182,619
5,182,623
5,182,627
5,182,707
5,182,726
5,182,729
5,182,730
5,182,760
5,182,779
5,182,785
5,182,793
5,182,810
49 : 5,181,566
5,181,726
5,181,916
5,181,952
5,182,104
5,182,251
5,182,317
50 : 5,182,468
51 : 5,181,297
5,181,327
5,181,387
5,181,716
5,181,803
5,181,873
5,182,067
5,182,097
5,182,356
5,182,413
5,182,418
5,182,424
5,182,464
5,182,555
53 : 5,181,332
5,181,527
5,181,560
5,181,638
5,181,822
5,182,146
5,182,307
5,182,368
5,182,564
54 : 5,181,397
5,182,338
55 : 5,181,296
5,181,372
5,181,477
5,181,665
5,181,688
5,182,152
5,182,208
5,182,212
5,182,420
5,182,461
5,182,473
5,182,512
5,182,518
5,182,794

04 : 332,812
06 : 332,687
332,696
332,700
332,711
332,712
332,721
332,722
332,729
332,740
332,741
332,755
332,756
332,781
332,783
332,811
332,824
332,831
332,836
08 : 332,714
332,715
332,821
09 : 332,699
332,733
332,737
12 : 332,706
332,784
332,802
332,839
13 : 332,746
17 : 332,713
332,727
332,738
332,844
332,846
332,849
332,851
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PLANT PATENTS

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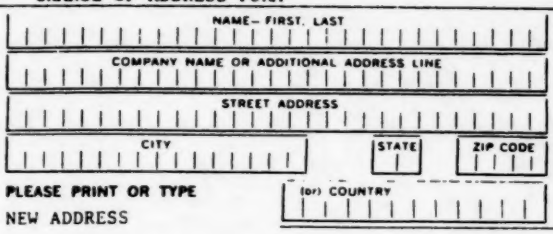

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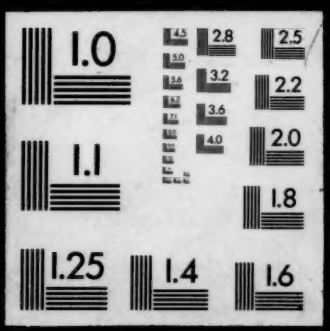
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